Medical Library

This Issue Exceeds 100,000 Copies

THE JOURNAL

OF THE

American Medical Association

SEP 20 1940

Subscription, $8.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 115, No. 12

COPYRIGHT, 1940, BY AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street, Chicago, Ill.

SEPTEMBER 21, 1940

CONTENTS AND SUBJECT INDEX

Fascial Repair of Inguinal Hernias: Chairman's Address. Thomas M. Joyce, M.D., Portland, Ore....971

The Management of Acute Craniocerebral Injuries. B. S. Brody, M.D., New Haven, Conn.....977

Cranial and Intracranial Complications of Acute Frontal Sinusitis. Paul C. Bucy, M.D., Chicago, and W. Tracy Haverfield, M.D., Jacksonville, Fla.....983

Anesthesia and Liver Injury. S. C. Cullen, M.D.; S. E. Ziffren, M.D.; R. B. Gibson, Ph.D., and H. P. Smith, M.D., Iowa City.....991

Discussed by Drs. Livingstone, Peterson, Weinberg and Cullen.

The Treatment of Chronic Deafness and Tinnitus Aurium with Prostigmine. Karl Musser Houser, M.D.; Edward H. Campbell, M.D., and Harry Schluederberg, M.D., Philadelphia 994

Fetal and Neonatal Deaths. Edith L. Potter, M.D., Chicago.....996

Discussed by Drs. Emge and Potter.

Dermatitis of the Hands in Housewives: Role of Soaps in Its Etiology and Methods for Its Prevention. James W. Jordon, M.D.; Frank A. Dolce, M.D., and Earl D. Osborne, M.D., Buffalo....1001

Discussed by Drs. Klauder, Sulzberger, Goodman, Muller, Rostenberg, Parkhurst, Pillsbury and Jordon.

Preparation and Preservation of Dilute Plasma. John Elliott, Sc.D.; G. F. Busby, M.D., and W. L. Tatum, M.D., Salisbury, N. C..1006

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Acute Appendicitis and Pinworm Infestation Occurring Concomitantly in the Same Family. Victor Mayer, M.D., Warren, Pa.....1009

SPECIAL CLINICAL ARTICLE

New Light on the Mechanisms by Which Nervousness Causes Discomfort. Walter C. Alvarez, M.D., Rochester, Minn.....1010

SPECIAL ARTICLE

The Pharmacopeia and the Physician: Leukorrhea—Clinical and Therapeutic Aspects. P. Brooke Bland, M.D., and Abraham E. Rakoff, M.D., Philadelphia....1013

COUNCIL ON PHYSICAL THERAPY 1018

COUNCIL ON PHARMACY AND CHEMISTRY 1019

EDITORIALS

The A. M. A. Platform.....1022

The Closed Plaster Method of Treating Compound Fractures and Infected Wounds.....1022

Histamine and Anaphylaxis.....1023

CURRENT COMMENT

The Selection of Military Pilots.1024

Deaths from Poisoning in Massachusetts 1024

BUREAU OF LEGAL MEDICINE AND LEGISLATION 1047

(Subject Index on next page)

MEDICAL PREPAREDNESS 1025

ORGANIZATION SECTION 1026

A. M. A. SESSION CLEVELAND JUNE 2-6, 1941

New (5th) Edition!—Cecil's Medicine

New (5th) Edition!—New peaks of success for "Cecil's Medicine"! Yes, this *New (5th) Edition—just published!*—is meeting with wholehearted approval... *approval* of the plan, scope and authorship of the work—*approval* of the comprehensive and sweeping character of the revision—and *approval* of the many practical features that long have distinguished this work as one of the most outstanding presentations of clinical medicine in the English language.

This is a working medical practice—*the practice of 144 of America's leading teacher-specialists*—authorities who know the demands of today's medical practice and teaching and have brought their full efforts to bear on satisfying these demands. For definitions, etiology, signs, symptoms, laboratory, instrumental and physical diagnosis, prognosis and treatment you can turn to this book confident that you will find therein the essential facts—today's methods and procedures. Special stress is placed on those disorders of greatest importance and frequency.

In this *New (5th) Edition*, there are 45 new and completely revised articles, many others that have been extensively changed and *131 new illustrations*. The entire work has been remade. *It is thoroughly up-to-date!*

By 144 American Authorities. Edited by RUSSELL L. CECIL, M.D., Professor of Clinical Medicine, Cornell University Medical College. 1744 pages, 6¼" x 9½", illustrated. Cloth, $9.50.

See Also SAUNDERS ADVERTISEMENT on Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics; "OS," Organization Section; "SS," Student Section.

A. M. A. Council on Industrial Health.OS-1026
radio program "Doctors at Work"...OS-1026
Alcoholism, intravenous alcohol for.....1040
Alkyl sulfonate as soap substitute.....*1001
Allergy and histamine.....E-1023
American Association of Obstetricians, Gynecologists and Abdominal Surgeons....1031
Public Health Association.....1031
Roentgen Ray Society.....1031
Anaphylotoxin, Dale-Laidlaw theory....E-1023
Anemia, congenital hemolytic.....1042
Anesthesia and liver injury.....*991
explosion danger from heater in operating room.....1040
Appendicitis, acute, and pinworm infestation.....*1009
Army, U. S., Medical Field Service School graduates.....1025
medical regiment marches 3,000 miles..1025
medico-military training course for reserve officers.....1032
Arteries, coronary disease, surgical treatment.....ab-1056
Association News.....1026
Aviation medicine, instruction in.....1025
selecting military pilots.....E-1024
transporting wounded by plane.....ab-1053
Banana treatment of diarrhea.....ab-1049
Blood chemical constituents, in milliequivalents, milligrams or millimols.....1041
pressure, high, and pyelonephritis....ab-1052
pressure, high continued, renal factor.ab-1054
prothrombin, and anesthesia.....*991
transfusion of plasma.....*1006
transfusion of preserved blood.....ab-1057
vessels disease and vitamin A deficiency.1034
Board Examinations.....1043
Bone, spongy, osteoma development in..ab-1051
Book Notices.....1043
Books Received.....Adv. page 36
Brain abscess after swimming.....*983
injuries, management.....*977
Bronchiectasis and pneumonia.....1042
Bureau of Animal Industry, changes in....1032
Bureau of Investigation.....1037
Bureau of Legal Medicine and Licensure..1047
Burma Road, closing of, and Chinese Red Cross.....1033
Calcium urolithiasis.....ab-1052
Cancer institute erected, Argentina.....1034
Cellophane eardrum.....ab-1059
Cerebrospinal Fluid pressure, effect of sorbitol.....ab-1049
Child study, extend, Calif.....1028
Colitis, ulcerative, spirochetes cause.....1034
Colon, mecholyl bromide for megacolon..ab-1049
Correspondence.....1038
Council on Industrial Health.....1026
Council on Pharmacy and Chemistry.....1019
Council on Physical Therapy.....1018
Cranium, complications after swimming....*983
fractures, management.....*977
Criminology, Latin American Congress of..1032
Deafness, hearing aids vs. silver-foil or cellophane eardrums for.....ab-1059
prostigmine for.....*994
Deaths.....1035
Dehydration agent: sorbitol.....ab-1049
Dementia paralytica, acetarsone and bismuth compound subcutaneously in.....ab-1060
Dermatitis of hands in housewives.....*1001
Diabetes Mellitus, treatment.....C-1038
Diarrhea, banana and banana powder for.ab-1049
Diphtheria, immunity.....1042
immunization.....ab-1050
immunization, alum precipitated toxoid.ab-1058
Diseases, reportable, District of Columbia..1028
Dysentery, bacillary, bacteriophage for..ab-1060
Ear, artificial drum of silver-foil or of cellophane.....ab-1059
Electron microscope, research fellowship...1031
Emotions, hypothalamus as thermostatic center.....*1010
Encephalitis virus cause of neurasthenia..*1010
Endocrinology, Inter-American Congress...1034
Eosinophilia with gastrointestinal symptoms.1041
Epilepsy, posttraumatic, after craniocerebral injuries.....*981
Erysipelas, sulfanilamide for.....ab-1053
Erythrocytes and radioactive iron.....C-1039
Estrogen, hyperestrogenism and hypoestrogenism cause of leukorrhea.....*1018
European War, English government to pay civilians for injuries.....1033
health after nearly a year, England.....1033
Fascia repair of inguinal hernias.....*971
Fatigue, mechanism of.....*1010
Fellowship, Fishbein, in rheumatic fever...1028
for research with electron microscope....1031
Fetus, death, statistical analysis.....*996
Fishbein, Morris Fishbein Jr. Memorial Fund.....1028
Fistula, biliary, effect of anesthesia on prothrombin level.....*991
Foreign Letters.....1033
Foundation, Riggs, Dr. Kimberly director..1029
Seaman Fund available.....1029
Fox, Hingston, death.....1033
Fractures, closed plaster method for....E-1022
Frontal Bone, osteomyelitis after swimming.*983
Frontal Sinusitis, acute, after swimming.*983
Gastrointestinal Tract symptoms and eosinophilia.....1041
Government Services.....1032
Gynecologists, American Association of....1031
Gynecology, First Brazilian Congress.....1032
Hands, dermatitis from soap in housewives.*1001
disability from old bullet wound.....1042
Head injuries, management.....*977
Health after year of war, England.....1033
American Public Health Association....1031
Hearing aids.....ab-1059
Hernia, inguinal, fascial repair.....*971
Histaminase.....1019; E-1023
Histamine and anaphylaxis.....E-1023
Homeostasis and hypothalamic nuclei.....*1010
Horder, Lord, discusses present health of England.....1033
Hospital, Bellevue, administration building.1030
Housewives, dermatitis of hands.....*1001
Hypothalamus as thermostatic center.....*1010
Industrial health, A. M A. Council on..OS-1026
medical service in factories made compulsory, England.....1033
Physicians and Surgeons, Michigan Association of.....1029
Infant, mother a typhoid carrier be allowed to nurse baby?.....1042
newborn, death, statistical analysis.....*996
Intracranial Pressure, increased, treatment.*978
Iron, radioactive.....C-1039
Jaundice, obstructive, effect of anesthesia on prothrombin level.....*991
Kidneys, factor in continued arterial hypertension.....ab-1054
Kimberly, C. H., director of Riggs Foundation.....1029
Lactation and typhoid.....1042
Legislation in U. S Congress.....OS-1027
Leukorrhea; clinical and therapeutic aspects.....*1013
Liver injury from anesthesia.....*991
Malbrán, Carlos G., death.....1034
Malpractice: head injuries; delay in taking roentgenograms.....Ml-1047
osteopaths; competency to testify against doctor of medicine.....Ml-1047
Marriages.....1034
Massachusetts, deaths from poisoning....E-1024
Meat, high protein diet.....1040
Mecholyl bromide for megacolon.....ab-1049
Medical Continuation courses, Minnesota..1029
Medical Examinations and Licensure.....1043
Medical Practice Acts: electrosurgery; naturopaths right to use.....Ml-1048
Medical Preparedness.....1025
Medical Preparedness, Council on Industrial Health assistance in.....OS-1026
Medical Service in factories compulsory, England.....1033
Medicolegal Abstracts.....1047
Meetings, Coming Meetings.....1048
Meister, Joseph, first to receive antirabies treatment, dies.....1032
Moniliasis, leukorrhea due to.....*1014
vulvovaginal.....ab-1059
Mononucleosis, infectious, convalescent serum in.....ab-1060
Navy, U. S., examination for appointment in medical corps.....1025
Neal, Paul A., appointment.....1032
Nerves, hormonal theory of transmission..*1012
Nervousness, new mechanism producing..*1010
Neurasthenia from encephalitis virus.....*1012
New and Nonofficial Remedies.....1021
News.....1032
Obesity, high protein diet in.....1040
Obstetricians, American Association of....1031
Obstetrics, course in, Indiana.....1028
Oliver, Edward A., appointment.....1028
Organization Section.....1026
Osteoma, osteoid, development in spongy bone.....ab-1051
Osteomyelitis of frontal bone after swimming.....*983
Oxyuriasis causing acute appendicitis....*1009
Paralysis, facial (Bell's) and syphilis.....1041
Pathologists, Louisiana Association formed.1029
Pediatrics, course in, Indiana.....1028
Pharmacopeia, U. S., and the physician..*1013
Physicians, government positions open.....1025; 1032
Plaster method (closed) for fractures and infected wounds.....E-1022
Pleura effusion after x-ray irradiation of abdomen or from uterine metastases...1042
Pneumonia and bronchiectasis.....1042
Poisoning, deaths from, Mass.....E-1024
Poliomyelitis, correct potassium chlorate dosage.....C-1038
nursing care of patients.....1031
situation, Mich.....1029
Prostigmine for deafness and tinnitus.....*994
Protein diet (high).....1040
Pyelonephritis and hypertension.....ab-1052
Queries and Minor Notes.....1040
Rabello, Eduardo, death.....1034
Radio Broadcasts.....1026
Radioactive iron.....C-1039
Red Cross, Chinese, and closing of Burma road.....1033
Rheumatic Fever, Morris Fishbein Jr. research fellowship.....1028
Roentgen Rays, pleural effusion from?.....1042
American Roentgen Ray Society.....1031
Scalp lacerations, careful inspection.*978; *982
School health services, committee on scope of.1029
of Aviation Medicine, instruction at....1025
Silver-foil eardrum.....ab-1059
Sleep disorders: nervousness.....*1010
Soaps, dermatitis of hands from.....*1001
Society Proceedings.....1048
Sorbitol as dehydrating agent.....ab-1049
Spinal Puncture, in craniocerebral injuries.*979
Spirochetes cause ulcerative colitis.....1034
Spirochetosis, leukorrhea from fusospirillosis.....*1014
State Board Examinations.....1043
Stillbirths, statistical analysis.....*996
Stillians, A. W., Dr. Oliver succeeds.....1028
Stomach cancer, early diagnostic methods inadequate.....ab-1056
cancer (early), etiologic indications...ab-1055
surgery, gastroscopy after.....ab-1056
Sulfanilamide treatment of erysipelas...ab-1053
Sulfonates, alkyl, as soap substitute.....*1001
Surgery, danger from floor furnace in operating room.....1040
Swimming, cranial and intracranial complications after.....*983
Syphilis and Bell's palsy.....1041
Thermostatic center: hypothalamus.....*1010
Thorax, penetrating wounds of chest...ab-1058
superior pulmonary sulcus tumor (correction).....1032
Thrombosis, venous (mesenteric).....ab-1050
Tinnitus aurium, prostigmine for.....*994
Tonics and Sedatives.....Adv. page 30
Torantil.....1019
Trichomoniasis, vaginal, leukorrhea in...*1014
Tuberculosis, hospital, new, Ind.....1028
Mississippi Valley Conference.....1031
nonpulmnoary, caused by bovine tubercle bacillus.....ab-1057
pulmonary, Monaldi's suction drainage of cavities.....ab-1059
pulmonary, thoracoscopy of extrapleural pneumothorax.....ab-1057
Tularemia, lesions in rabbits.....1041
Typhoid immunity in infant and nursing..1042
Urethritis, granular, cause frequent urination.....1042
Urinary Tract calcium calculi.....ab-1052
Urination, frequent in young girl.....1042
Uterus cervical infections, leukorrhea in..*1013
tumor metastasis cause pleural effusion?.1042
Vaginitis, nonspecific, leukorrhea in.....*1014
Vital Statistics, deaths from poisoning, Mass.....E-1024
in Uruguay.....1031
Vitamin A deficiency in vascular diseases..1034
K deficiency, liver injury from anesthesia.*991
Vulvovaginitis, moniliasis.....ab-1059
Woman's Auxiliary.....1027
Wounded, transportation by plane.....ab-1053
Wounds, gunshot, hand disability from....1042
infected, closed plaster method for....E-1022

THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $8.00 a year. 25c a copy. Canadian $9.50. Foreign $12.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

CRESCENT surgeons blades
RIGIPOISED MIKRO-KEEN and costs LESS!
WRITE FOR FREE SAMPLE
Crescent Surgical Sales Co., Inc.
440 FOURTH AVENUE
NEW YORK, N. Y.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 115, No. 12 — COPYRIGHT, 1940, BY AMERICAN MEDICAL ASSOCIATION CHICAGO, ILLINOIS — SEPTEMBER 21, 1940

FASCIAL REPAIR OF INGUINAL HERNIAS

REPORT OF 760 OPERATIONS FROM JANUARY 1934 TO JANUARY 1939

CHAIRMAN'S ADDRESS

THOMAS M. JOYCE, M.D.

PORTLAND, ORE.

Today the surgeon in almost every instance can assure the patient with inguinal hernia that he will be cured. Yet less than six decades ago such assurance was the exception rather than the rule. Up to that time treatment of this ancient affliction had been principally palliative.[1] In the earliest times bandages were applied to retain reducible hernias. Later the truss was introduced and throughout the centuries of its use underwent numerous modifications. Poultices and plasters of various astringent and tonic substances were long popular. Frequently a red hot cautery, varying in size and shape with the individual patient, was applied to the skin over the area of protrusion, which had previously been outlined with ink. Caustic agents were similarly employed. The object of both the cautery and the caustics appears to have been to destroy the tissues and thus to produce granulation firm enough to prevent recurrence of the protrusion. As late as the nineteenth century, the first procedure resorted to in the treatment of strangulated hernia was the ancient one of taxis. When this failed, bleeding, warm baths, purgatives, opiates, local cold applications and finally tobacco clysters were tried. The ensuing faintness of the patient was believed to cause relaxation of the involved areas and so to facilitate reduction of the extruding viscera. Lawrence [1] also mentioned the local application of cupping glasses and leeches for relief of strangulation.

The injection treatment of hernia is probably almost 150 years old. According to Fowler [2] the Frenchman Desault, who died in 1795, treated the combined hernia and hydrocele of a 9 year old boy with injections of red wine into the scrotum and lower part of the canal. Some fifty years later this form of treatment was again practiced by workers in Europe and America.[3] Both the fluids used and the manner of injecting them varied. This means of managing hernias, however, made slow progress and with the advent of improved surgical procedures was almost forgotten. Within recent times it has once more been revived and today is widely used.

While operation for nonstrangulatad hernia was practiced as early as the first century and quite possibly before that, this mode of treatment was not developed until hundreds of years later.[4] In the middle ages the operative field was almost entirely dominated by unskilled traveling "rupture curers," many of whom were unscrupulous quacks who not only failed to effect a cure but sacrificed the testicles of their unsuspecting victims as well. On the other hand, there were gifted men among them who not only improved the prevailing treatments but devised valuable new ones. It was a celebrated rupture and stone cutter of the sixteenth century, Pierre Franco, who undertook operation for relief of incarcerated hernia, a procedure avoided up to that time. With the reintroduction of dissection of human bodies in the sixteenth century, careful study of the structures involved in the formation of hernias was made possible. Significant and revolutionary contributions began to appear and new interest in the surgical treatment of hernias was gradually stimuated. By the beginning of the nineteenth century the anatomy of hernias was well understood. Operations for strangulated hernias were relatively frequent. Then, as now, the technics followed varied considerably. The results obtained, however, were far from favorable, so that surgical intervention was resorted to only after all other procedures had failed. It was not until anesthesia was accepted and Lister's principles of antisepsis were established that the greatest obstacles to the ultimate successful treatment of hernia were removed.

In 1892 Marcy,[5] Lister's first American pupil, argued that delayed operative intervention and not the operation was responsible for the unsatisfactory results of that period. He called attention to the fact that Sir Astley Cooper,[6] "even in his day" (the beginning of the nineteenth century), "when the lack of anesthetics and of the requisite knowledge of proper wound treatment rendered the operation truly formidable," had recognized "the fatal error of delay." Marcy is credited with being the first to have practiced exposure of the inguinal canal by dissection, high ligation of the sac and plastic repair of the inguinal canal. In 1881 he [7] had advocated the use of absorbable kangaroo tendon sutures.

Within a few months of each other, in 1889, appeared the independent reports of the operations devised by

From St. Vincent's Hospital and the University of Oregon Medical School Hospitals.

Read before the Section on Surgery, General and Abdominal, at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

1. Andrews, Edmund: A History of the Development of the Technic of Herniotomy, Ann. M. Hist. **7:** 451-466 (Sept.) 1935. Lawrence, William: Treatise on Ruptures, from London ed. 5, Philadelphia, Lea & Blanchard, 1843, chaps. 5-9, pp. 76-147. Raaf, J. E.: Hernia Healers, Ann. M. Hist. **4:** 377-389 (July) 1932. Garrison, F. H.: An Introduction to the History of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1929, pp. 35, 155, 161, 171, 220, 225, 227, 274, 321, 333, 337, 342, 344, 480, 598, 600, 730. Halsted, W. S.: Surgical Papers, Baltimore, Johns Hopkins Press **1:** 261-308, 1924.

2. Fowler, S. W.: Pioneers in Hernia Injection, M. Rec. **146:** 481-485 (Dec.) 1937.

3. Wangensteen, O. H.: The Status of the Injection Treatment of Hernia, Ann. Surg. **105:** 322-324 (March) 1937. Raaf.[1] Halsted.[1] Fowler.[2]

4. Buck, A. H.: The Growth of Medicine from the Earliest Times to About 1800, New Haven, Yale University Press, 1917, pp. 482, 490 Allbutt, T. C.: Greek Medicine in Rome, London, MacMillan Company, Ltd., 1921, pp. 345, 408. Thompson, Malcolm: The Operative Story of Hernia, Am. J. Surg. **43:** 162-168 (Jan.) 1939. Footnote 1.

5. Marcy, H. O.: The Anatomy and Surgical Treatment of Hernia, New York, D. Appleton & Co., 1892, chaps. 9 and 10, pp. 100-113.

6. Cooper, Astley, quoted by Marcy,[5] p. 97.

7. Marcy, H. O.: The Cure of Hernia by the Antiseptic Use of Animal Ligature, Tr. Internat. M. Cong., 7th session **2:** 446-448, 1881.

Bassini of Italy and Halsted of America. In essentials, the two operations were the same. Bassini [8] did a high ligation and dissection of the sac, brought the cord out through the muscles at the internal ring, placed the transplanted cord so that it lay on the internal oblique muscle and sutured the internal oblique muscle to Poupart's ligament—attempting in his repair to reestablish the obliquity of the canal. Halsted [1] constructed a new canal and a new external ring. Like Bassini, he ligated the sac as high as possible and sutured the internal oblique muscle to Poupart's ligament. The cord, however, he transplanted superficial to the aponeurosis of the external oblique. It was not long before Halsted began to modify his original technic. First he deemed it unnecessary to transplant the cord, then he discontinued his earlier practice of excising some of the veins of the cord to make it smaller. Later he incorporated a flap from the anterior sheath of the rectus muscle. Finally he employed the cremaster muscle and its fascia to reinforce the lower bed of the canal and also overlapped the aponeurosis of the external oblique. Halsted considered high ligation of the sac the most important factor in the operation.

The principles of the methods devised by Bassini and by Halsted, as every surgeon knows, are still the basis of the repairs done today. The numerous modifications of these original operations are more or less variations in the manner of disposing of the cord and of reconstructing the inguinal canal in an attempt to attain a more solid repair and thus to prevent recurrence of the hernia.

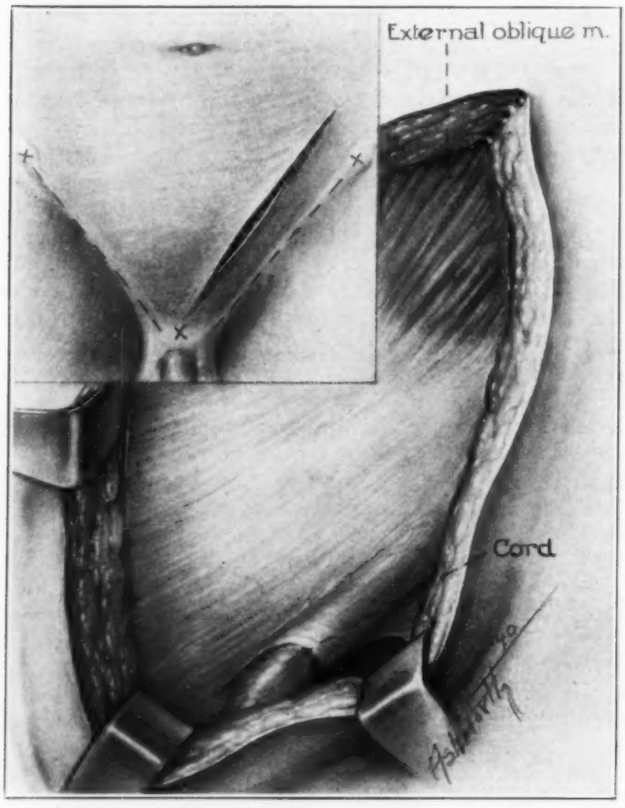


Fig. 1.—Incision.

Contributing in a large measure toward the reduction of the percentage of hernial recurrences is the utilization of fascia for reinforcing the repair, particularly in the form of sutures. McArthur was the first to employ living tendon as suture material. In 1901 he [9] published a preliminary description of his method of cutting a narrow strip from the aponeurosis of either flap of the split external oblique and suturing the structures to be apposed with these strips. Both fascial strips were left attached at the pubic spine. Nine years later Kirschner [10] reported a method of overlapping the deep Bassini sutures with a rectangular patch of fascia lata. One border of this "free" fascial transplant was quilted to Poupart's ligament, the others were quilted to the abdominal musculature. The cord was brought out through a slit in the upper medial border of the transplant. Gallie and LeMesurier [11] in 1921 presented the results of experiments which had led them to the conclusion that a strong repair of the abdominal wall could be obtained by means of narrow fascia lata sutures. They threaded the narrow strips of fascia lata into curved large eyed needles and united the structures by interweaving the fascial sutures across the opening. For the closure of large hernial openings Gallie [12] later recommended a many tailed fascial sheet. He pulled the "tails" through the abdominal wall and then tied each opposite pair over the opening. In 1934 Wangensteen [13] described his method of repairing inguinal hernias by means of a pedicle graft from the iliotibial tract. The flap is swung into the wound up over Poupart's ligament and sutured over the cord.

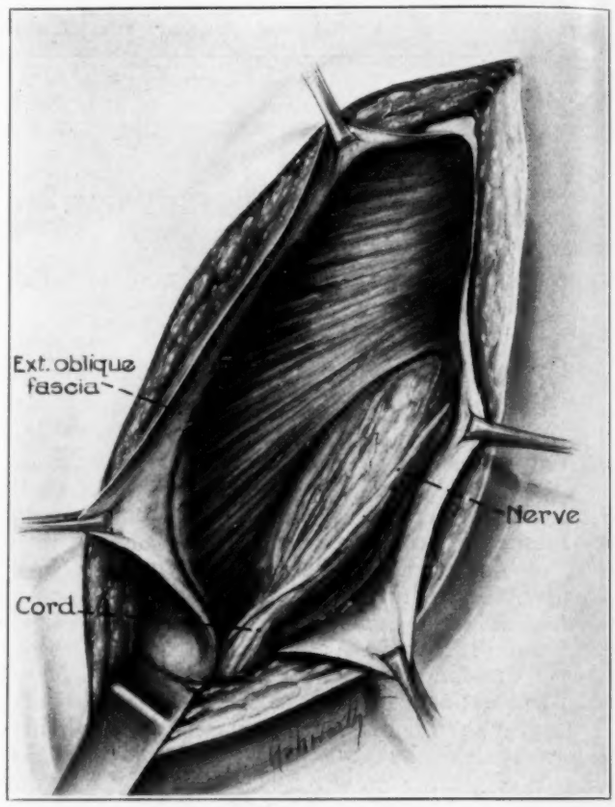


Fig. 2.—Splitting fascia of external oblique exposure of cord, nerve and cremaster muscle.

8. Bassini, Eduoardo, cited by Halsted.[1]

9. McArthur, L. L.: Autoplastic Suture in Hernia, and Other Diastases: Preliminary Report, J. A. M. A. **37:** 1162-1165 (Nov. 2) 1901; Autoplastic Sutures in Hernia and Other Diastases: Final Report, ibid. **43:** 1039-1048 (Oct. 8) 1904.

10. Kirschner, Martin: Die praktischen Ergebnisse der freien Fascien-Transplantation, Arch. f. klin. Chir. **92:** 888-912, 1910.

11. Gallie, W. E., and LeMesurier, A. B.: The Use of Living Sutures in Operative Surgery, Canad. M. A. J. **11:** 504-513 (July) 1921.

12. Gallie, W. E.: Closing Very Large Hernial Openings, Ann. Surg. **96:** 551-554 (Oct.) 1932.

13. Wangensteen, O. H.: Repair of Recurrent and Difficult Hernias and Other Large Defects of the Abdominal Wall Employing the Iliotibial Tract of Fascia Lata as a Pedicled Flap, Surg., Gynec. & Obst. **59:** 766-780 (Nov.) 1934.

The consensus at present appears to be that fascia is indicated only for hernias difficult to repair, among which are included direct inguinal, ventral and recurrent hernias. It has been my contention for some time that if fascia is desirable in the repair of difficult hernias it is just as desirable in the repair of hernias that are not difficult; furthermore, that a large percentage of recurrences could be prevented if fascia were used as a routine in the initial repair. In my own practice I repair all primary indirect inguinal and femoral hernias, as well as all direct inguinal, ventral and recurrent hernias, with fascial sutures. My technic is a modification of older procedures—combining Halsted's [1] early transplantation of the cord, Andrews' [14] imbrication of the aponeurosis of the external oblique and McArthur's [9] sutures from the external oblique fascia or Gallie and

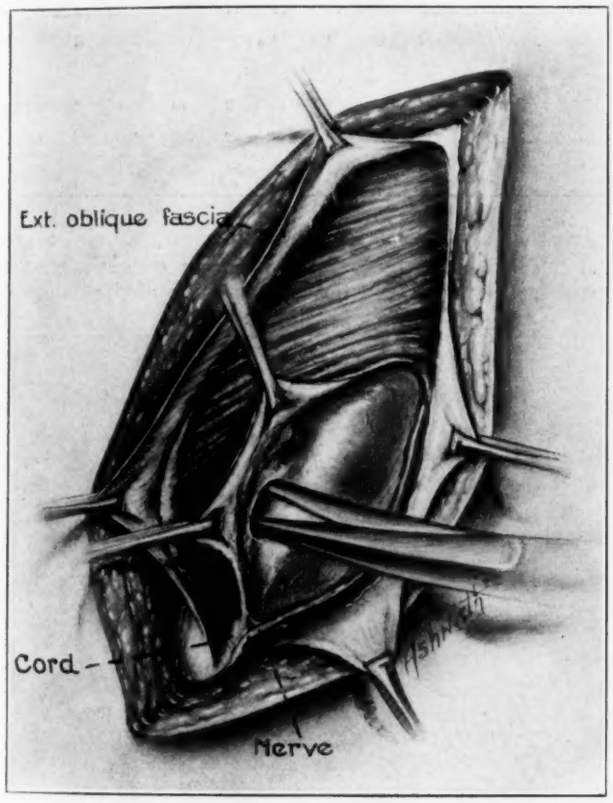


Fig. 3.—Separation of cremaster muscle from cord.

LeMesurier's [11] fascia lata sutures. The most important factor in this technic is the suture of fascia only to fascia, a running fascial stitch being used for the deep line of sutures. It has been my experience that muscle sutured to fascia does not give a firm union because the muscle fibers have a tendency to separate. Gallie and LeMesurier [15] have had a similar experience. They stated that "side-to-side suture of muscle and aponeurosis, as in the suture of the internal oblique muscle to Poupart's ligament, results in union of practically no strength."

OPERATIVE PROCEDURE

An oblique incision, parallel to Poupart's ligament, is made through the skin and fat, high enough on the abdomen so that a bandage can later be applied without any inconvenience to the patient. After the fascia of the external oblique has been exposed, all the areolar tissue is carefully removed from it with gauze. The fascia is then split in the line of its fibers, directly superior to the upper border of the inguinal canal, from a point above the external ring to well above the internal ring.

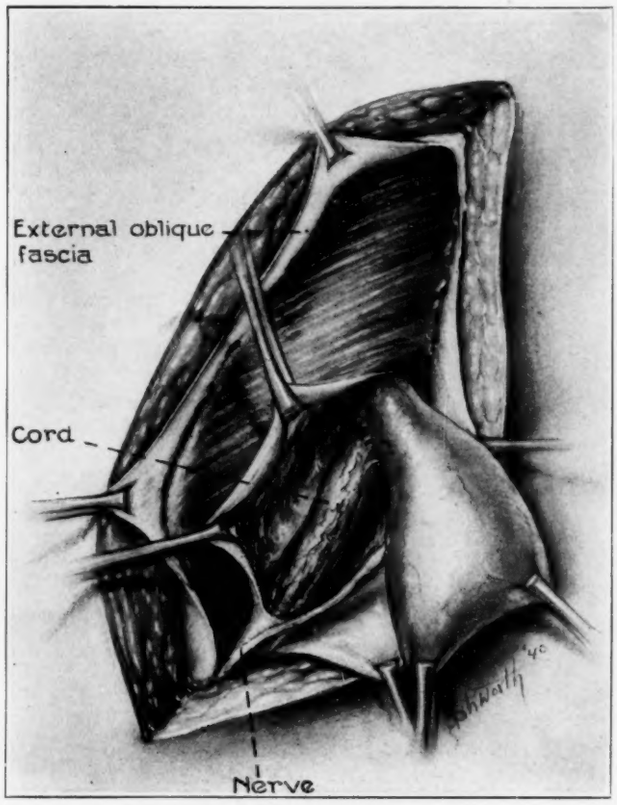


Fig. 4.—Sac, isolated cord and nerve below.

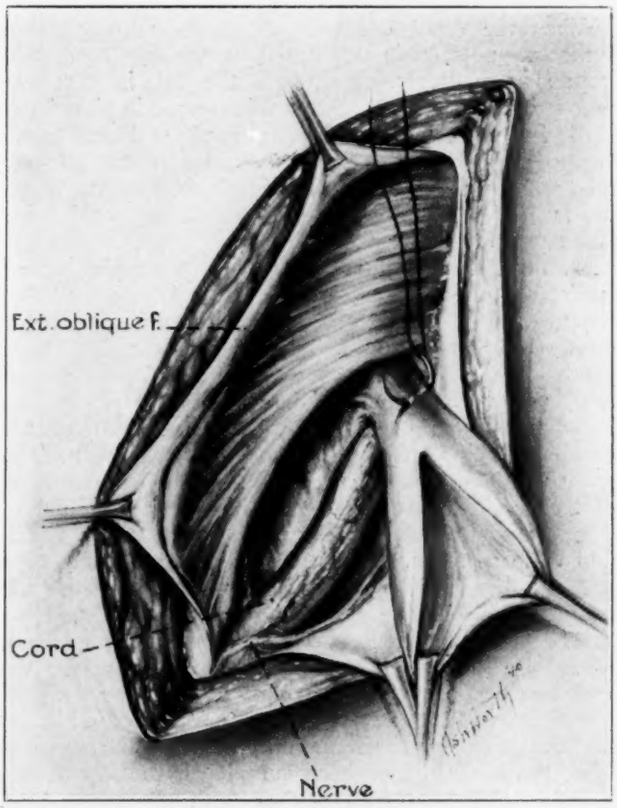


Fig. 5.—Sac opened to be ligated and excised.

14. Andrews, E. W.: Imbrication or Lap Joint Method: A Plastic Operation for Hernia, Chicago M. Rec. **8**: 67-77 (Aug.) 1895.
15. Gallie, W. E., and LeMesurier, A. B.: The Use of Free Transplants of Fascia as Living Sutures in the Treatment of Hernia, Arch. Surg. **9**: 516-529 (Nov.) 1924.

The interior flap is dissected free down to the shelving edge of Poupart's ligament and retracted; the superior flap is freed for about 2 cm. and also retracted. Care is taken to preserve the ilio-inguinal and iliohypogastric nerves and their branches.

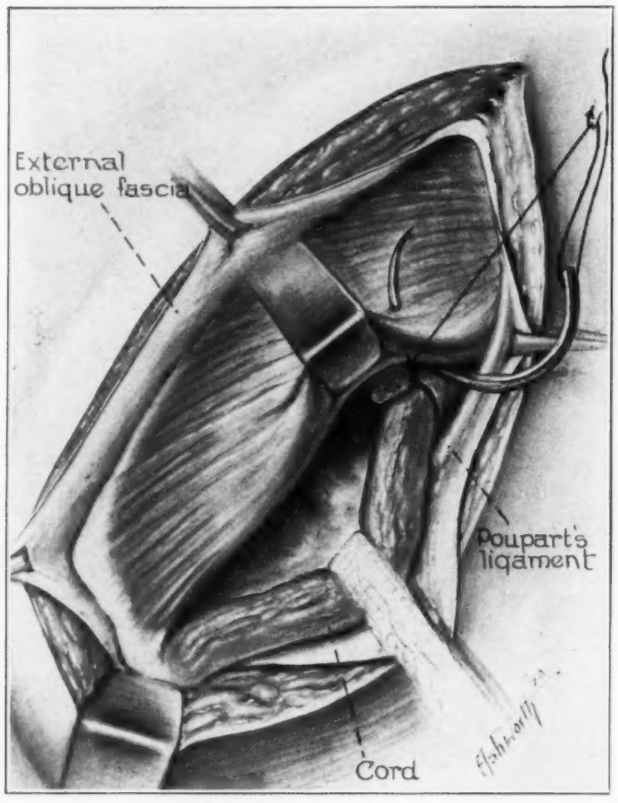


Fig. 6.—Transfixion of stump of sac high under external oblique muscle.

When the canal has been exposed completely, the cremaster muscle is separated from the cord and dropped posteriorly. Next all the fat is carefully removed from the cord. After this the sac is picked up, freed from its attachments, opened and inspected, clamped, ligated as high as possible, and its stump transfixed well up under the external oblique muscle. When this is completed the cord is elevated and held aside with small tapes.

A strip of fascia, about one-fourth inch wide, is now cut from the edge of the fascia of the superior flap of the external oblique. The cutting is begun close to the muscle belly and continued down to the pubic spine, where the strip is left attached. As a rule, the fascial strip is about 5 inches long. This fascial strip is then threaded with a needle of smaller caliber than the so-called Gallie needle and secured in it with silk. The smaller needle does not separate the fibers as much as the larger Gallie needle, so that there is less possibility of subsequent weakness of the tissues through which the needle is drawn. With the fascal strip, which is used as a running stitch, the fascial border of the superior flap of the external oblique is sutured to the shelving edge of Poupart's ligament up to the internal ring. Here the fascial strip is locked both below and above the cord, leaving an opening just large enough for the cord to emerge without constriction. The approximation is then continued for the remaining length of the opening. After the suturing has been completed, the fascial end is firmly anchored with silk or with chromic catgut. The cord is now released from the tapes which had held it aside. The inferior flap of the external oblique is brought over the cord and sutured with catgut to the fascia of the superior flap of the external oblique. Thus fascia is sutured to fascia in every respect. The subcutaneous tissue is closed with plain catgut, and the skin is closed with silk.

TABLE 1.—*Summary of Operations with Incidence of Recurrence*

Surgeons	Single		Bilateral			Total Operations	Operations Traced	Recurrences	Per Cent in Traced Operations
	Indirect	Direct	Indirect-Direct	Indirect	Direct				
Dr. Pfleuger.....	11	2	..	..	..	13	13	0	....
Dr. Weeks.....	137	39	..	..	..	176	176	1	0.56
Author and associates.....	93	19	14	38	16	180	134	1	0.80
University of Oregon Med. School Hospitals:									
Staff surgeons...	41	21	2	18	2	84	51	2	3.92
Externs and residents.....	213	18	8	66	2	307	180	12	6.66
Totals.....	495	99	24	122	20	760	544	16	2.94

In the repair of recurrent hernias, or in those instances in which, after the inguinal canal has been opened, it is found that the superior flap of the external oblique does not have sufficient fascia so that it can be brought down to the shelving edge of Poupart's ligament and also permit the removal of a suture, fascial strips are taken from the thigh by means of an instrument devised by Dr. James C. Masson.[16] In order to

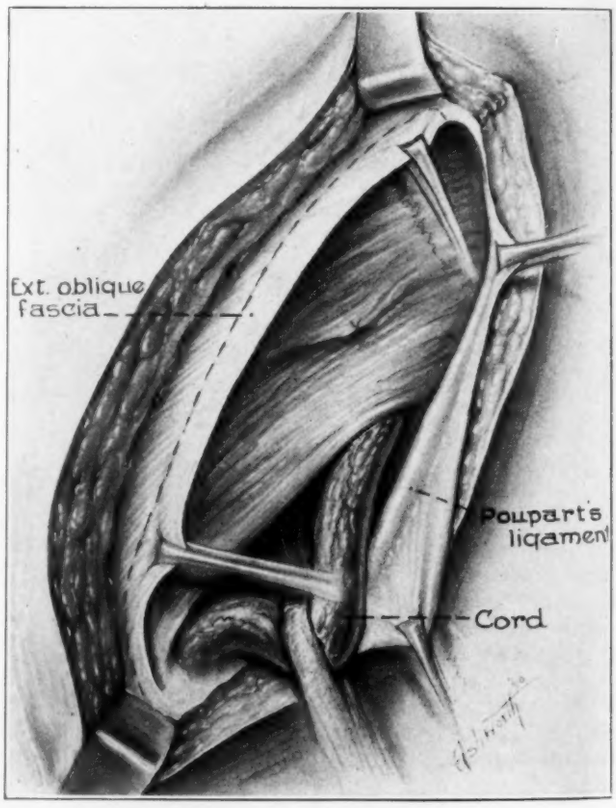


Fig. 7.—Sac retracted; fascial suture outline.

16. Masson, J. C.: A New Instrument for Securing Fascia Lata for Repair of Hernia, Proc. Staff Meet., Mayo Clin. **8**: 529-530 (Aug. 30) 1933.

be prepared for such a contingency, one leg is always shaved the night before operation and just before the operation it is prepared for immediate use. The fascia lata strip is used to approximate the structures in the same manner as the strip from the fascia of the external

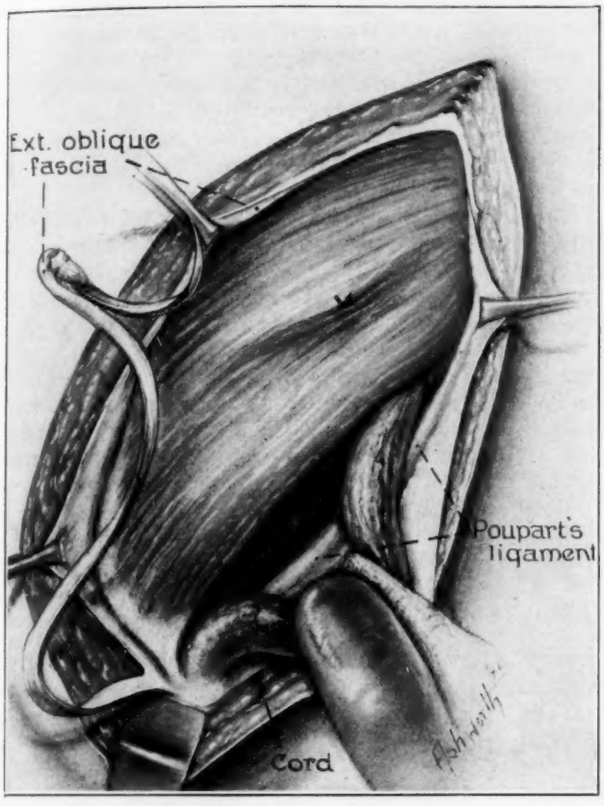


Fig. 8.—Fascia threaded on needle.

oblique. No more than one strip of fascia is ever taken from the external oblique. When it is necessary to use additional strips, they are secured from the thigh.

In the five year period from January 1934 to January 1939 my associates and I did 180 hernial repairs by this

TABLE 2.—*Recurrences in Relation to Time Interval and Age*

Postoperative Interval	Number of Recurrences	Age of Patient
3 weeks or less	2	51, 51
2 months	2	56, 57
5 months	4	48, 50, 51, 67
8 months	2	51, 58
10 months	3	46, 46, 60
1 year	1	53
1½ years	1	58
3¾ years	1	55

method on 149 private patients at St. Vincent's Hospital. Of these, 124 operations were traced. In this group there was one recurrence, a percentage of 0.8 (table 1).

Three hundred and ninety-one hernias on 337 patients were repaired with fascia in the University of Oregon Medical School Hospitals in a similar period. Twelve externs and residents performed 307 of these operations. The remaining eighty-four were performed by twelve staff surgeons. Of the 231 operations traced, 180 had been done by the externs and residents. There were fourteen recurrences, twelve of which followed the repairs by the inexperienced surgeons, a percentage of 6⅔ for the inexperienced surgeons and 3.92 for the more experienced surgeons (table 1). An investigation was recently made of the higher recurrence rate in the University of Oregon Medical School Hospitals. It was found that some surgeons had not followed explicitly all the details which had originally been emphasized in the fascia to fascia with fascia technic. In some instances muscle had been sutured to fascia with fascia, in others the external oblique had been brought over to the shelving edge of Poupart's ligament and sutured with chromic catgut. In these instances the muscle had pulled away from the line of suture. On the other hand, one resident who had followed every detail of the technic with meticulous care had no recurrences in forty-three traced operations. He had done seventy-five hernial repairs, a little more than one fourth of the total number performed by all the externs and residents.

Dr. Alanson Weeks,[17] chief of staff of St. Luke's Hospital in San Francisco, using the same technic, has done 176 operations. He reported one recurrence, 0.56 per cent (table 1). In a recent communication, Dr. Weeks stated that he had given instructions to the other surgeons on the staff of St. Luke's Hospital to repair the inguinal hernias of all patients entering through the clinic of that hospital by the technic described in this paper.

Dr. Otto H. Pflueger [17] of San Francisco did thirteen operations on twelve patients with this method. He has had no recurrences (table 1).

The average age of the patients was 48 years. Three patients were 14 years old, the youngest, and one patient was 84, the oldest. With the exception of one

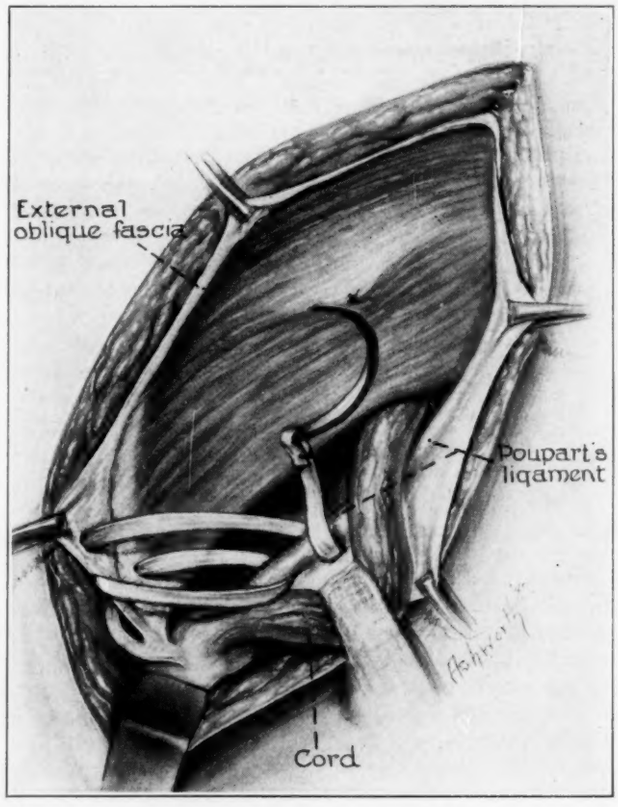


Fig. 9.—Suturing of lower border of external oblique fascia to the shelving edge of Poupart's ligament.

man with bilateral recurrences, who was 46 and another who was 48, the age of each patient who had had a recurrence was 50 or over (table 2). By far the greatest number of operations was performed on male patients.

17. Personal communication to the author.

The majority of the recurrences, as nearly as could be determined, were discovered from three to ten months after operation. In three instances the hernias recurred a year, a year and a half and three years and nine months after the repair. In one instance the hernia

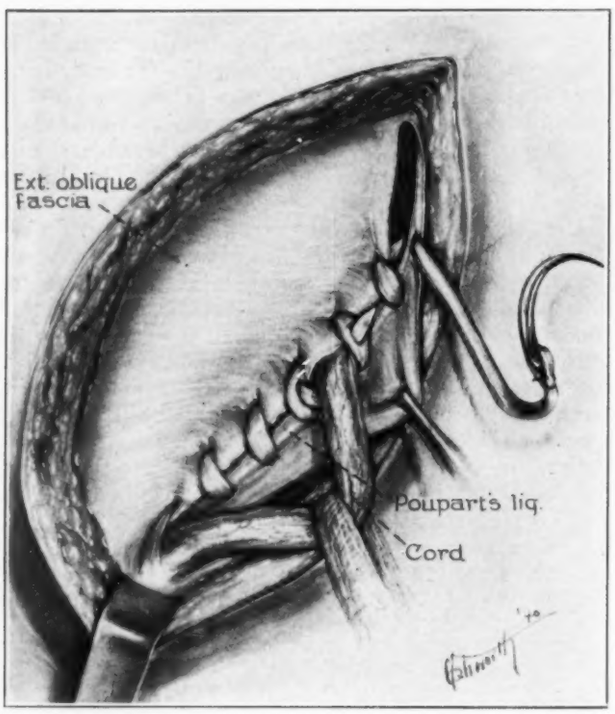


Fig. 10.—Fascial suture almost completed; note fixation about internal ring.

was noted almost immediately after operation (table 2). This was the recurrence reported by Dr. Weeks. The patient had had an obstruction in the sigmoid which required abdominal operation, and the hernia wound had become infected. There were seven other wound infections, all following operations performed at the

TABLE 3.—*Incidence of Postoperative Deaths*

Number of patients	674
Number of deaths	5
Percentage	0.74
Cause of death:	
Bronchopneumonia	3
Coronary thrombosis	1
Bilateral pulmonary embolism	1

University of Oregon Medical School Hospitals. In this group there was one recurrence five months after operation. In my own practice I have had two infected wounds, each of which followed the fascial repair of a postoperative ventral hernia. There was no sloughing of the fascia, however, in either instance, and neither hernia recurred.

In a few instances swelling of the testicle was noted after operation. In every instance this subsided before the patient left the hospital. No atrophy of the testicle was observed.

There were five postoperative deaths (table 3) in the entire group of 674 patients, or 0.74 per cent. In three instances the principal cause of death was bronchopneumonia. One death was due to coronary thrombosis. The last was attributed to bilateral pulmonary embolism. This patient had had recurrent bilateral indirect hernias repaired. Twelve patients, or 1.79 per cent, died from causes not related to the operation at intervals of from two to three years later.

The type of anesthesia used was of no consequence whatever.

SUMMARY

1. A large percentage of hernial recurrences could be prevented if fascia was used in the primary repair.

2. The most important factor in the method of repair of the canal here described is the suture of fascia only to fascia with fascia. The operation is simple to perform; there is little danger of excessive trauma and, when all the details as outlined are observed, the results are excellent.

3. The principal steps of the technic are (*a*) careful removal of all areolar tissue from the fascia of the external oblique; (*b*) separation of the cremaster muscle from the cord, care being taken to preserve the ilio-inguinal and iliohypogastric nerves and their branches; (*c*) removal of all fat from the cord; (*d*) high ligation and transfixion of the sac; (*e*) suture of the fascial edge of the superior flap of the split external oblique to the shelving border of Poupart's ligament with a narrow fascial strip from either the external oblique or the thigh; (*f*) bringing the inferior flap of the split external oblique over the cord, and (*g*) suturing the edge of the imbricated inferior flap to the fascia of the superior flap of the external oblique.

4. A total of 760 operations were performed on 674 patients. Of this number, 544 operations were traced.

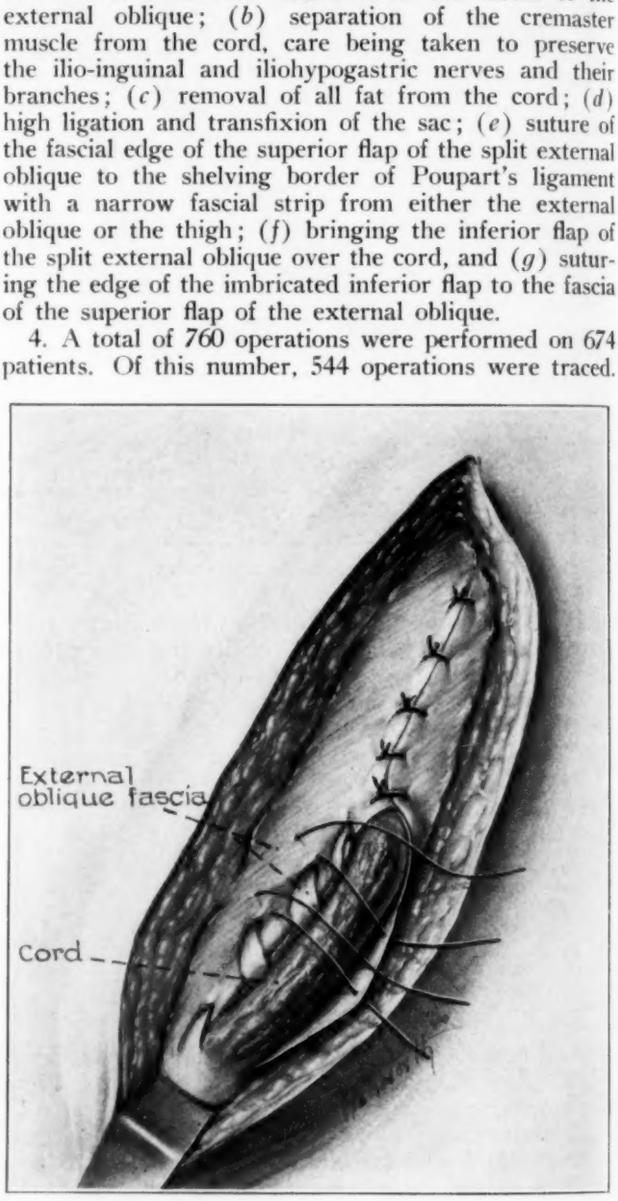


Fig. 11.—Completion of reconstructed inguinal canal.

There were sixteen recurrences, a percentage of 2.94 for all the traced operations. By individual surgeons or groups the incidence of recurrence was: Dr. Pfleuger, no recurrences in thirteen operations; Dr. Weeks, 0.56 per cent in 176; my associates and I, 0.80 per cent in 124; twelve staff surgeons of the University of Oregon Medical School Hospitals, 3.92 per cent in fifty-one,

and twelve externs and residents of the same hospitals, 6.66 per cent in 180 operations.

5. There were five postoperative deaths, or 0.74 per cent.

6. The average age was 48 years, the youngest patient being 14 and the oldest 84. In the majority of instances the age of the patients with recurrences was above 50.

7. There were eight wound infections. In two instances the infection was followed by recurrence of the hernia—almost immediately and five months after operation, respectively.

8. In all instances of swelling of the testicle the swelling subsided before the patient left the hospital. No testicular atrophy was observed.

1130 South West Morrison Street.

THE MANAGEMENT OF ACUTE CRANIOCEREBRAL INJURIES

BERNARD S. BRODY, M.D.
NEW HAVEN, CONN.

In no field of medicine do there exist more sharply opposed views than those expressed by various investigators on the subject of trauma to the brain and its membranes. The variation in teaching by men of equally large experience is hopelessly confusing to the large number of practitioners who are faced with the problems of head injury. The dissemination of opinion concerning the treatment of cranial injuries is important because the automobile has increased enormously the number of such patients for physicians in out of the way places where the services of a neurosurgeon are not readily available.

The development of the modern treatment of trauma to the brain has been influenced particularly by the work of Kocher [1] and Cushing,[2] by Weed and his collaborators [3] and as a result of the extensive experience which came out of the World War. Kocher and Cushing described the four classic stages of brain compression and Weed found that increased intracranial tension may be influenced by changing the osmotic pressure of the blood through the agency of hypertonic solutions. As an introduction to the classification of cranial injuries I have adopted the outline of Munro (table 1), which was included in a report of 1,494 cases treated at the Boston City Hospital over a period of four and a half years. Table 2 will give some idea concerning the mortality in Munro's [4] series. A noteworthy point is the rather small percentage of subdural and extradural hematomas, of which there were only eighty in all. The first two groups, which together comprise a total of 1,211 patients, could be classified as nonoperative. The last two groups, totaling 159 patients, may or may not have required surgical treatment, depending on the character, extent and location of the fracture.

The great majority of patients then will recover with ordinary bed rest supplemented in some instances by lumbar puncture or hypertonic solutions. Those patients with an uncomplicated concussion should be kept in bed for approximately ten to fourteen days. Roentgenograms of the skull, when needed for medicolegal reasons or otherwise, can be taken when the patient's condition warrants the effort. A diagnostic spinal puncture should be done at some time within the first week. Any small amount of bleeding which might have been present may be missed after seven days. For patients whose spinal fluid is bloody or whose period of unconsciousness is prolonged, the diagnosis of simple concussion alone is no longer tenable and the period of bed rest must be proportionately longer.

In the final analysis, responsibility to the patient with a cranial injury resolves itself into three categories: There is first the prevention of infection, second the treatment of increased intracranial pressure and lastly the management of depressed fractures.

PREVENTION OF INFECTION

The prevention of infection, for the most part, is simply a matter of giving prompt and efficient attention to lacerations of the scalp. Also included is the prompt administration of antiserums in cases in which there are contaminated wounds. More rarely one is confronted with a patient who has definite evidence of a fracture through the mastoid or paranasal sinuses in the form of cerebrospinal otorrhea or rhinorrhea. The second condition is more frequently followed by meningitis than the former. In my opinion these patients should be started promptly on sulfapyridine as a preventive measure. This drug is used because the pneumococcus is the most common invading organism. If the patient develops meningitis, a change in therapy may be indicated depending on the outcome of the bacteriologic study. Cases are seen with persistent bleeding from the nose or ear in which it is difficult to determine whether an admixture of spinal fluid is present or not. X-ray examination may be able to settle this point, as for example a fracture through the cribriform plate would strongly suggest the presence of rhinorrhea. The laminagraph has been of considerable help in this regard. Patients with rhinorrhea should be placed on isolation precautions in order to prevent as far as possible the contraction of an upper respiratory infection. Intranasal therapy should be avoided, and the patient must be on his guard against sneezing or otherwise raising the intranasal pressure for fear of forcing secretions through the fracture line into the cranial chamber. Intra-aural examination should be avoided in the case of bleeding or spinal fluid leakage from the ear. The ear should be covered with a sterile dressing and kept dependent so as to encourage external drainage. The majority of cases of spinal fluid leakage, especially from the ear but also from the nose, stop spontaneously. In some instances the drainage will persist for months or years and may eventually require surgical intervention for closure of the fistula. From the standpoint of prevention of infection, the practice of elevating the foot of the bed about 12 inches has been of material help in decreasing the incidence of aspiration pneumonia in patients who are in deep coma. The advantage gained by avoiding the gravitation of vomitus or nasal secretions into the lungs far outweighs the possible disadvantage of increasing the intracranial pressure in lowering the head below the level of the feet. This modified Trendelenburg position need be employed only when the nasopharynx seems to be filling rapidly with mucus

From the Department of Surgery, Yale University School of Medicine.

1. Kocher, Theodor: Hirnerschütterung Hirndruck und chirurgische Eingriffe bei Hirnerkrankungen, in Nothnagel, H.: Specielle Pathologie und Therapie, Vienna, A. Hölder, 1901, vol. 9, p. 2.

2. Cushing, Harvey: Concerning a Definite Regulatory Mechanism of the Vasomotor Center Which Controls Blood Pressure During Cerebral Compression, Bull. Johns Hopkins Hosp. **12**: 290, 1901.

3. Weed, L. H., and Hughson, Walter: Systemic Effects of the Intravenous Injection of Solutions of Various Concentrations with Especial Reference to the Cerebrospinal Fluid, Am. J. Physiol. **58**: 53 (Nov.) 1921.

4. Munro, Donald: The Diagnosis, Treatment and Immediate Prognosis of Cerebral Trauma, New England J. Med. **210**: 287-294 (Feb. 8) 1934.

or vomitus and can be resorted to intermittently rather than continuously as the conditions warrant. It is also important in deeply comatose patients to keep them on the side and to alternate the lateral position. In this way the tendency to swallow the tongue is obviated, and secretions tend to run out the angle of the mouth.

TABLE 1.—*Classification of Head Injuries* *

- Skull
  - Linear and/or comminuted fracture
  - Depressed fracture
  - Compound fracture
  - Special fractures (basilar)
    - Involving paranasal sinuses
    - Petrous bone
    - Cribriform plate (ethmoid)
- Brain
  - Concussion
  - Edema
  - Contusion and/or laceration
  - Hemorrhage
    - Subdural or extradural
    - Special
      - Rarer forms
        - Subpial
        - Subcortical
        - Intraventricular
        - Venous sinus
      - Petechial
  - Infection
    - Meningitis
    - Abscess

* Modified from Munro.

A compound depressed fracture is a condition which requires immediate attention in order to avoid the onset of a serious infection. This calls for prompt débridement of devitalized tissues, which may include some of the cerebral cortex as well, if it has been lacerated. This procedure need not leave a bone defect except in cases in which a part of the skull has been badly comminuted, because a block of bone can be removed, molded back almost to its normal contour, boiled and then replaced.

TREATMENT OF INCREASED INTRACRANIAL PRESSURE

The treatment of increased intracranial pressure revolves, of course, about the diagnosis. Those patients who present the classic symptoms of extradural or subdural bleeding, that is a short period of unconsciousness due to concussion, then a lucid interval of minutes or hours, followed by a progressive loss of consciousness, will die almost invariably unless the clot is removed. The second lapse into unconsciousness is due to cerebral compression from the clot. The evolution of the clinical picture is ordinarily much faster in the case of extradural bleeding because the hemorrhage is arterial and requires prompt surgical attention. There are, however, a group of patients who do not present this classic picture and yet harbor a definite clot. In particular the lucid interval is missing for the reason that there is, in addition to the clot, extensive underlying brain damage. In this instance the unconsciousness due to the damage of cerebral tissue per se will merge with the coma due to the increasing intracranial pressure produced by the extradural or subdural clot. These cases present a more difficult problem from the standpoint of diagnosis and constitute the group in which multiple trephine holes are indicated. In this way a clot may be located which may have been overlooked even by careful observation and a life saved if the underlying cerebral damage is not too extensive. The great majority of patients with cranial injuries do not show any alarming degree of increase in intracranial pressure as indicated by lumbar puncture and, more specifically, do not show a pressure over 200 mm. of water. Those patients who are severely injured and persist in showing an elevated spinal fluid pressure would best be subjected to multiple trephine openings and, in the event that no clot is found, a generous decompression should be made if the brain appears to be under serious pressure. The indications for a decompression are extremely rare, however.

The importance of a thorough neurologic examination of the patient on admission and at frequent intervals thereafter cannot be too forcefully emphasized. The appearance under observation of focal neurologic signs and particularly a state of progressive loss of consciousness are a clear indication by and large for surgical intervention. On the other hand, an injured person with a cerebral laceration will ordinarily show focal neurologic signs on the first examination, and there will be a tendency in the direction of improvement in the neurologic picture and particularly a progressive return to consciousness. The majority of patients with cortical lacerations or contusions will show bloody spinal fluid but with no alarming elevation of pressure. Patients with minor degrees of subarachnoid bleeding may not present a clinical picture which differs in essentials from those with a moderate degree of concussion. The diagnosis must be made by a lumbar puncture performed within a few days after the injury. Those persons with more marked subarachnoid bleeding show some degree of nuchal rigidity, confusion, dizziness, restlessness, irritability, drowsiness, headache, vomiting and a slight elevation of temperature. These patients are unquestionably made more comfortable by lumbar punctures done usually at twenty-four hour intervals but again at shorter or longer intervals, depending on the amount of blood and the elevation of the spinal fluid pressure.

MANAGEMENT OF DEPRESSED FRACTURES

It is almost axiomatic that every scalp laceration should be carefully examined under sterile precautions before being sutured, to establish the presence or absence of an underlying fracture. This will not be possible, of course, unless the bone is exposed. Further information concerning the nature of the fracture, if it appears grossly to be depressed, should be obtained by x-ray examination before the wound is closed. A simple linear fracture should be no matter of concern and no indication for immediate x-ray examination. A compound depressed fracture must be treated promptly in the manner and for the reasons already discussed. Only occasionally will a patient be in such a degree of shock from gross tearing of the brain as to be unfit for any immediate major surgery. If the fracture is not compound, operative treatment is usually not indicated unless the size of the depressed fragment is sufficient to reduce materially the size of the intracranial cavity. The popular opinion that depressed

TABLE 2.—*Mortality* *

	Totals		Mortality, %	
	Neurosurgical	Rest of Hospital	Neurosurgical	Rest of Hospital
Concussion	0	496	....	0.8
Edema, contusion and laceration	376	339	10.9	28.0
Rupture of middle meningeal artery	10	7	70.0	85.0
Subdural hematoma	30	33	36.6	90.6
Compound fracture	60	47	31.6	59.5
Depressed fracture	29	23	3.4	39.1

* Modified from Munro.

fragments, per se, may result in epilepsy is not substantiated by recent knowledge of the pathologic response of the brain to trauma. Late epileptic manifestations are due to the formation of a cerebral cicatrix rather than to any irritative effects of a depressed fragment. Glaser and Shafer [5] have recently reported

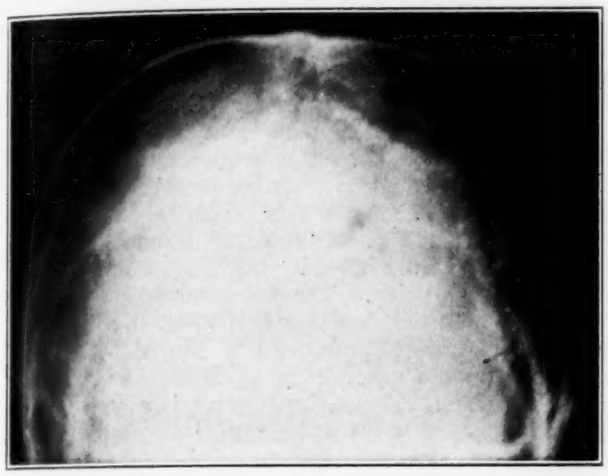


Fig. 1 (case 1).—Depressed fracture in left occipitoparietal region.

an eight year follow-up of ninety-one patients with depressed fractures. Their conclusion was that early elevation of the depression did not prevent the development of late sequelae in this series. This corresponds to the experimental observations of Naffziger and Glaser.[6] The experimental data do not support the usual conception that the continued pressure of a rounded depression on the brain will cause further damage and consequently that elevation should be carried out at any time with or without symptoms. Elevation should be confined to fractures of a fragmented and spiculated nature wherein the dura has been lacerated and the brain traumatized. It is difficult to be specific as to the type of case which does not require elevation because frequently even after careful radiologic examination one is unable to state with any degree of certainty whether the dura and cortex have been grossly injured. Each case is a problem unto itself and requires the judgment and attention of a neurosurgeon. The primary objective in the operative treatment is the débridement of devitalized tissues and the repair of the cranial deformity. If infection is not present, the fragments of bone may be replaced. A delay of more than six hours (approximately) enhances materially the chances of infection. The average traumatic wound, if promptly irrigated and debrided in a thorough fashion, will rarely become infected and requires no drainage. When conditions make it necessary to postpone indefinitely any major surgery, the wound should be carefully cleaned and sutured so as to insure a sterile field for the secondary operation.

USE OF HYPERTONIC SOLUTIONS AND LUMBAR PUNCTURE

One will occasionally see patients so severely injured that death occurs within a few hours or at least within twenty-four hours of the accident. For the most part, these patients show some abnormality of respiration and more particularly irregularities of rhythm. They ordinarily show signs of marked cerebral irritation and one hesitates in doing anything but the most simple procedures because almost every stimulus seems to throw the injured into a paroxysm of hyperventilation, extensor spasm and extreme restlessness. In any event there is little if anything that can be done to save this type of patient. Some of them, however, in spite of the extremely ominous picture which they present, survive the immediate critical period and gradually return to consciousness after days or weeks. The prolonged period of unconsciousness is due to widespread cerebral lesions in the nature of multiple lacerations and contusions, or petechial hemorrhages or extensive hemorrhage into the brain stem from the vein of Galen, with associated edema and cell damage. It is this group in which the method of repeated lumbar punctures and conservative use of hypertonic solutions has its best clinical application. These measures should not be carried beyond the stage at which increased pressure is no longer demonstrable by lumbar puncture, however. Actually a patient can be brought to a critical state by overenthusiastic dehydration, and a remarkable transformation will occur with administration of generous amounts of fluid, in a manner similar to the effect of dextrose in insulin shock. Afebrile patients should receive about 1,500 cc. of fluid in twenty-four hours, and those with fever proportionately larger amounts.

I have already mentioned that a very large proportion of cases of craniocerebral injury fall into the classification of simple uncomplicated concussion and that roentgenograms of the skull need not be taken during the first week. According to Glaser and Blaine,[7] x-ray films of the skull taken from six months after injury in children to nine months after injury in adults are

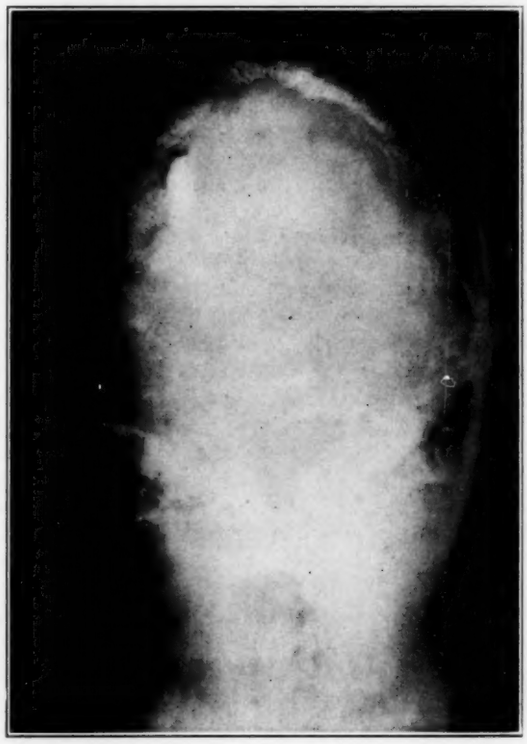


Fig. 2 (case 2).—Depressed fracture in right occipital region.

5. Glaser, M. A., and Shafer, F. P.: Depressed Skull Fractures; Value of Surgery; Sequelae; An Eight Year Follow-Up Study of Ninety-One Patients, J. A. M. A. **113:** 2111-2116 (Dec. 9) 1939.

6. Naffziger, H. C., and Glaser, M. A.: An Experimental Study of the Effects of Depressed Fractures of the Skull, Surg., Gynec. & Obst. 51: 17-30 (July) 1930.

7. Glaser, M. A., and Blaine, E. S.: Duration of Fractures and Operative Defects of the Skull as Revealed by Roentgenograms: Follow-Up Study of One Hundred Patients, J. A. M. A. **107:** 21-24 (July 4) 1936.

as valuable as those taken immediately after injury in determining the presence or absence of fracture. The indications for immediate roentgenograms are few and in this regard I have mentioned compound fractures and fractures through the sinuses as examples. In cases of serious injury in which the diagnosis is somewhat in doubt, roentgenograms of the skull may be helpful if a shift of the pineal gland can be visualized. The danger of subjecting a patient with a severe head injury to the moving and gyrations necessary for obtaining a series of roentgenograms is obvious. A simple linear fracture of the vault carries no serious import in spite of the aura which has been spun about it by lay persons and in the courtroom. Basilar fractures may be more significant should the sinuses or the cranial nerves be involved.

Fig. 3 (case 2).—Excised block of bone in place after depressed portion at its center had been remolded. The small radiopaque bodies are silver clips.

Lumbar puncture affords a direct approach to the withdrawal of fluid from the cranial cavity. At the same time it is an important diagnostic measure when subarachnoid hemorrhage is suspected. Recent experimental observations suggest that the removal of spinal fluid may minimize certain sequelae such as headache and dizziness. A word of caution is advisable regarding the indiscriminate use of this therapeutic measure. The absence of danger is not unanimously accepted, and in the light of our present knowledge it appears wiser to refrain, if possible, from the use of a lumbar puncture during the first twenty-four hour period. This is based on the assumption that intracranial hemorrhage might be accelerated by the rapid removal of cerebrospinal fluid. It is often not necessary to tap patients with a cerebrospinal fluid leak because the drainage automatically relieves any pressure which might be present, although this is not always the case. There is some danger in reducing the pressure to a point at which there is a reversal of the flow at the site of the fracture and a natural tendency toward introduction of infection into the subarachnoid space. Meningitis of traumatic origin is subject to the same methods of therapy as meningitis of the more common types. The spinal fluid pressure may at times be misleading in the evaluation of the state of the patient. I have noted in several instances that on successive daily punctures the spinal fluid tended gradually to return to normal, whereas the patient was actually becoming more drowsy. Exploration in these cases revealed a subdural hematoma with decidedly increased intracranial pressure. The discrepancy is probably explained by either an incisural or a foraminal block.

In general it is suggested that sedatives be avoided because of the natural tendency to obscure the picture of progressive somnolence which is so important from the standpoint of diagnosis. Extreme restlessness may precede or accompany a state of progressive stupor due to increasing intracranial pressure, and the tendency to complicate the picture with sedation may make the differentiation difficult. The tendency in particular to sedate intoxicated patients is fraught with grave danger, since one already has to decide whether the hyperactivity and/or somnolence is primarily an alcoholic or a pressure effect. Body restraints usually increase the agitation. The restlessness is not infrequently due to a simple matter such as an overdistended bladder. The bladder can often be emptied by manual expression and a possible infection due to catheterization may be avoided. Restlessness is a rather common accompaniment to subarachnoid hemorrhage and can be controlled in part by repeated lumbar punctures. Morphine in particular is contraindicated because of its depressing effect on the vital centers. Headache can usually be controlled by acetylsalicylic acid. It has been my practice, with patients who are conscious on admission or regain consciousness shortly after, to arouse them for a vocal response at hourly intervals for at least twenty-four hours. In this way it renders it unlikely that a patient will lapse into unconsciousness through the night without this transition having been discovered. This is of particular importance with children and patients who are not hospitalized. A few patients will show considerable elevation of temperature and this is best treated with alcohol sponges, with care being taken not to cool the surface of the body too rapidly. In some instances ice water enemas are more effective. The vital signs are recorded at half hourly intervals for from twenty-four to forty-eight hours in all cases and longer in the more critically injured.

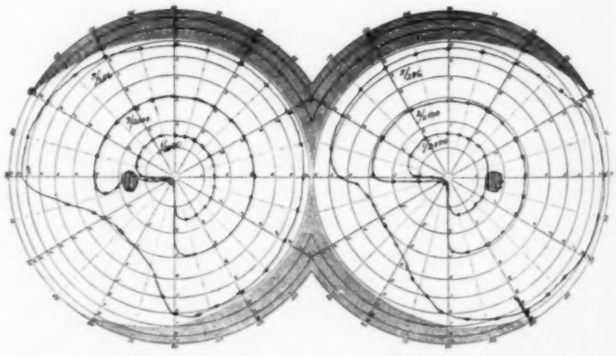


Fig. 4 (case 2).—Visual fields taken fourteen months after the accident.

Patients with head injuries for the most part are not in any notable degree of shock unless there has been excessive loss of blood from a surface laceration or some crushing injury to the bones, or some internal injury. Attention is called to the distinction between so-called primary shock and secondary shock. The former is usually regarded as consisting of a relative lowering of blood volume through vasodilatation, the latter of an absolute lowering of blood volume through

loss of blood or plasma. There is some evidence that trauma to the brain produces a type of shock presenting more nearly the characteristics of primary shock. The state of primary shock is ordinarily very short lived and need be of no special concern. Removal of the cause, replacement of the lost blood volume, rest and heat are the accepted treatment for secondary shock.

It should be stated that mortality figures have been published in several large series of cases and that there is but little statistical discrepancy between them, although the therapy varied in all three. Fay reported 556 cases with a gross mortality rate of 18.2 per cent, Munro 505 personal cases with a mortality of 15.6 per cent and Coleman 453 cases with an 18.5 per cent mortality. Fay is the proponent of rigid dehydration, Munro employs modified dehydration, and Coleman shows a distinct inclination away from both lumbar drainage and dehydration. The objections in general to the use of hypertonic solutions are twofold: the danger of increasing the intracranial bleeding and

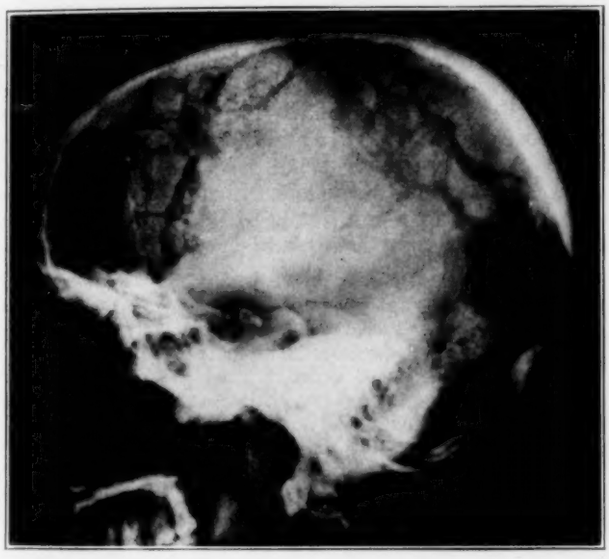


Fig. 5 (case 3).—Multiple fractures of the skull with extension through the cribriform plate and into the frontal sinus.

the almost inevitable secondary rise in spinal fluid pressure which follows the use of hypertonic dextrose. There is some evidence that hypertonic sucrose injection is usually not followed by a secondary rise in pressure. It is also stated that the prolonged administration of hypertonic solutions may have a deleterious effect on the kidneys.

Before the presentation of case histories, emphasis should again be laid on the fact that the classic signs of increasing intracranial pressure, and especially a notable rise in blood pressure with a concomitant increase in pulse pressure, may be a relatively late development in the clinical picture. In fact, if one waits for a striking rise in blood pressure the patient may not survive even if a blood clot is successfully removed. In my experience a tendency to extreme restlessness and increasing stupor has been an earlier and more reliable indicator of increasing intracranial pressure than the vital signs. There are occasional patients who show no striking change in vital signs at all, in spite of there being considerable compression present from a blood clot. It is of course important to tabulate the vital signs and one occasionally sees unequivocal indications of increasing intracranial pressure. More often, however, the changes in vital signs are more subtle, and it is well to be on the lookout for additional criteria in the diagnosis of intracranial bleeding.

REPORT OF ILLUSTRATIVE CASES

CASE 1.—R. C., a white youth aged 15 years, was involved in an automobile accident at the age of 5 years which resulted in a short period of unconsciousness. A laceration was noted in

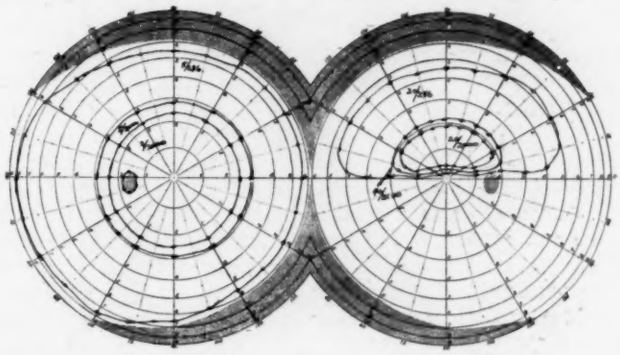


Fig. 6 (case 3).—Visual fields taken one year after the accident.

the left occipitoparietal region, which was sutured but no roentgenograms were taken.

In his fourteenth year, nine years after the accident, he had four seizures described as tonic in nature and a final episode which consisted solely of a transient numb sensation on the left side of the body beginning in the leg. The neurologic examination at this time was negative. X-ray examination of the skull showed a small depressed fracture (fig. 1) in the left occipital region. An electro-encephalogram showed seizure discharges from the right occipitoparietal area.

This case illustrates the fallacy of the common conception that a depressed fracture is of itself a constant source of posttraumatic epilepsy and should therefore be elevated. The electro-encephalogram confirmed the clinical opinion that the epileptogenic focus was on the opposite side of the brain from the fracture and that the depression was of no importance. This is to

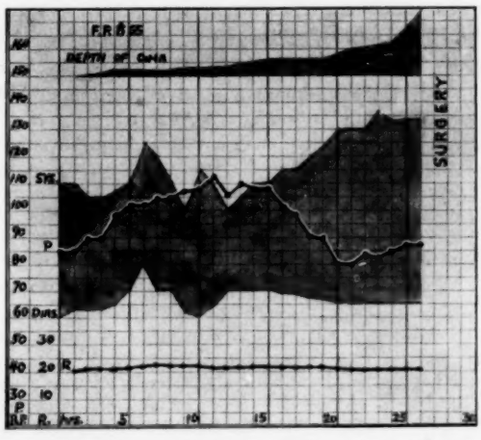


Fig. 7 (case 5).—Note the moderate elevation of the blood pressure in a case in which there are two clots, one subdural, the other extradural. A change in the state of consciousness preceded the alteration in the blood pressure by about fourteen hours.

be explained on the basis of a contrecoup injury in the right occipitoparietal cortex.

CASE 2.—R. D., a white man aged 20, was admitted to the hospital on Oct. 25, 1938, about fifteen minutes after having been struck by an automobile. He had been dazed but was not unconscious. There was a laceration of the scalp about 6 cm. long in the right occipital region. The edges of the wound were separated under sterile precautions and some clot was

washed out. When this was being done a small piece of brain tissue measuring a few millimeters floated up. Gross examination of the visual fields revealed a complete left homonymous hemianopia. X-ray examination (fig. 2) showed a depressed fracture at the site of the scalp laceration.

The patient was taken to the operating room. Under local anesthesia the wound was explored and a block of bone removed

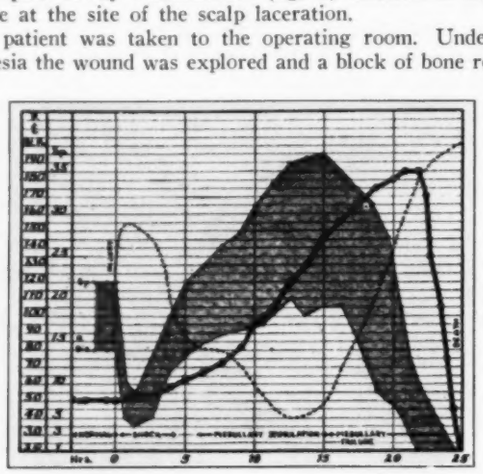


Fig. 8.—Course of events following a rise in intracranial pressure according to a conception widely employed and taught in surgical practice. After recovery from the initial shock the intracranial pressure rises and there is a pari passu rise in the blood pressure and fall in pulse rate until medullary failure ensues. From this point on the blood pressure falls, the pulse races and shock becomes evident, leading almost inevitably to death. (After Browder, Jefferson, and Meyers, Russell: Behavior of the Systemic Blood Pressure, Pulse Rate and Spinal Fluid Pressure, Arch. Surg. **36**: 1 [Jan.] 1938.)

with the depressed portion at its center. The macerated portion of the cerebral cortex was debrided, as was also the dura, which was then closed. The bone flap was sterilized, remolded and replaced into the skull defect (fig. 3).

The importance of careful inspection of scalp lacerations is emphasized by this case. The clean removal of macerated cerebral tissue and dura lessen the chances for the later development of a meningocerebral cicatrix. Roentgenograms taken fifteen months after the injury showed considerable absorption of bone in the block which had been excised and replaced (fig. 3). In spite of the x-ray appearances, the operative area was just as firm as the rest of the skull. Visual fields (fig. 4) taken at the same time showed a residual left homonymous inferior quadrantic defect.

CASE 3.—J. R., a white man aged 44, was admitted to the Milford Hospital on May 31, 1936, shortly after having been injured in a two car collision. He remained in coma for twelve hours. There was a compound fracture (fig. 5) in the right frontal region extending into the frontal sinus, orbit and cribriform plate of the ethmoid. No evidence of rhinorrhea was noted, although there had been some bleeding from the nose. He was discharged after five weeks.

After three weeks at home he was admitted to the New Haven Hospital because of a sudden elevation of temperature associated with severe headache. Drainage of spinal fluid from the right nostril was noted, and the presence of a meningitis was confirmed, which lasted for about ten weeks. He ultimately made a complete recovery except for anosmia and an almost complete loss of vision (fig. 6) on the right. The rhinorrhea stopped with the subsidence of the meningeal infection and has not recurred in the three intervening years.

A meningeal infection may follow a basilar fracture through the paranasal sinuses as soon as thirty-six hours after the injury and indeed be so fulminating as to be fatal in spite of modern chemotherapy. It should be noted that the cerebrospinal rhinorrhea did not appear until eight weeks after the injury. There is a feeling generally among neurosurgeons that a cerebrospinal rhinorrhea requires a prompt closure of the rent in the dura, in spite of the fact that many of them tend to stop spontaneously, because there is the constant threat of a meningeal infection.

CASE 4.—H. O., a white man aged 39, was admitted to the New Haven Hospital on Feb. 26, 1939, shortly after being injured in an automobile accident. He was semiconscious on admission, quite noisy and agitated. There was some weakness of the right side of the face and the right arm. In the next few days there seemed to be gradual improvement, and it became apparent that a definite aphasia was present, of a motor type. The initial spinal puncture showed a bloody fluid under increased pressure, but by the eighteenth day the fluid was clear and under normal pressure. In the meantime, however, a low grade papilledema had appeared and roentgenograms of the skull taken at this time showed a shift of the pineal gland to the right, measuring 3 mm. The steady but slow improvement in his speech and mental condition seemed at odds with the development of papilledema and a pineal shift. The diagnosis rested between a laceration in the left frontotemporal region or a subdural clot. Consequently trephine holes were made in the left frontal, temporal and parietal regions on the left, but no blood clot was found. Within six weeks of the time of the accident there had been a complete restitution of function and the patient has remained well.

This case illustrates the contrast in the clinical picture between a cortical laceration and a subdural clot. With the former, one usually finds abnormal neurologic signs on the first examination, unless the lesion is in a silent area, followed by a slow steady improvement, especially in the mental state. The pineal shift and papilledema tended to be misleading. The exploratory operation was undertaken in spite of the apparent improvement in order to make absolutely sure that the speech area was not being subjected to local pressure.

CASE 5.—F. P., a white man aged 55, was struck by a truck on July 20, 1939, and was immediately rendered unconscious. He was semiconscious on arrival in the emergency room about one hour after the accident. Neurologic examination at this time showed no abnormal signs. During the first twenty-four hours there was some improvement in that he seemed aware of his surroundings and took nourishment, but there was no attempt to speak. On the second day he became increasingly drowsy, the right pupil seemed slightly larger than the left, and the pulse and respirations were assuming a slower rate. A spinal puncture showed a bloody fluid under a pressure of

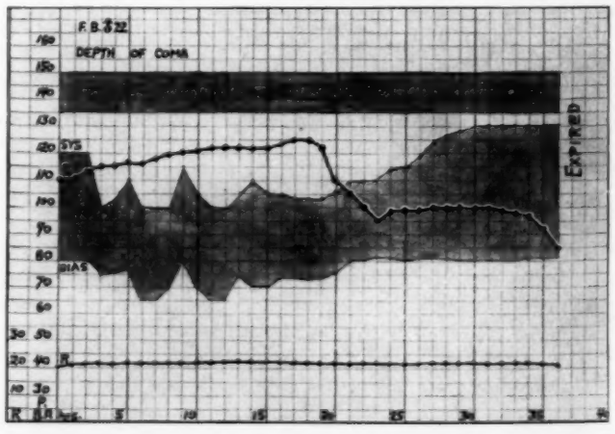


Fig. 9 (case 6).—Vital signs during the thirty-six hours prior to the patient's death. During the first four days after the injury the vital signs maintained a constant level. On the fifth day, about eighteen hours before the patient died, there occurred a moderate elevation of blood pressure and slowing of the pulse. The patient was in deep coma during the entire illness. At autopsy a large subdural clot was found.

165 mm. of water. His blood pressure gradually rose from a level of about 120 systolic, 70 diastolic to 135 systolic, 60 diastolic. He was taken to the operating room, where a trephine opening was first made in the left temporal region because of the absence of spontaneous speech in the lucid interval (first twenty-four hours). When the dura was opened

a clot was encountered and a large quantity of clotted and unclotted blood was evacuated. A trephine hole was then made in the right temporal region and on opening the dura a small amount of thin yellow fluid escaped. The burr hole was then enlarged and toward the upper margin of the exposure the edge of an extradural clot was seen which proved to be of considerable size. This clot was also evacuated. There was rather prompt improvement following the operation.

The progressive tendency toward a stuporous state and the lack of return of spontaneous speech were in sharp contrast to the events in case 4, in which a diagnosis of cortical laceration was made. The left side was explored first because of the aphasia. The right side was also opened because the right pupil tended to be somewhat larger than the left and because of the fact that bilateral subdural hematomas are fairly common. The combination of a large subdural clot on one side and an extensive extradural clot on the other is rather unusual. Attention is called to the lack of striking changes in the vital signs (fig. 7) and to the slight elevation in spinal fluid pressure in spite of the amount of clot found. Figure 8 illustrates the course of events in a hypothetic case following a rapid rise in intracranial pressure according to a conception widely employed and taught. This alarming degree of alteration in the vital signs is not often seen, however, and one must be prepared to act on more subtle changes in the vital signs plus a tendency toward increasing somnolence.

CASE 6.—F B.., a white man aged 22, was brought into the hospital on June 17, 1934, about a half hour after having been struck by an automobile and instantly rendered unconscious. He was in deep coma on admission and there was obvious respiratory distress. The pupils were fixed, the right being semidilated and the left fully dilated. There developed in the next twenty-four hours a flaccid weakness of the right arm and leg. On the third day the right pupil had returned to its normal size but the left pupil was still widely dilated and the eyeball was practically fixed as the result of oculomotor paralysis. The spinal fluid on the fourth day was bloody and under a pressure of 130 mm. of water, a drop of 120 points from the pressure reading taken forty-eight hours previously. His temperature ranged between 101 and 104, his respirations were irregular and the pulse varied between 100 and 140. The blood pressure remained between 100 systolic, 70 diastolic and 130 systolic, 80 diastolic. There was a marked degree of restlessness associated with a constant state of unconsciousness. A left lower lobe pneumonia was noted on the fourth day, and on the following day he died. At postmortem a large subdural clot was found on the left side. In addition there were lacerations of the basilar surface of the left frontal and temporal lobes and multiple subcortical petechial hemorrhages.

There were multiple brain injuries in this case, and the subdural hematoma was only one factor in the production of the clinical picture depicted. It is in just such an an instance, in which the classic signs and symptoms of subdural hematoma are lacking because of additional injuries, that multiple exploratory trephine openings are indicated. Certainly if the subdural clot had been found and removed, the chances for survival would have been better. Attention is again called to the fact that the vital signs were fairly constant and within normal limits for the first four days, and there then followed in the few hours preceding the patient's death a moderate rise in blood pressure (fig. 9). A third nerve (oculomotor) paralysis which follows a head injury may be due either to a contusion or laceration of the nerve or, as in this case, to compression from a blood clot.

New Haven Hospital.

CRANIAL AND INTRACRANIAL COMPLICATIONS OF ACUTE FRONTAL SINUSITIS

PAUL C. BUCY, M.D.
CHICAGO
AND
W. TRACY HAVERFIELD, M.D.
JACKSONVILLE, FLA.

The most common complications of acute frontal sinusitis, particularly that which follows swimming, are abscess of the frontal lobe and osteomyelitis of the frontal bone.[1] Within recent years the rhinologists and neurosurgeons have adopted more or less successful methods of dealing with these complications. Nevertheless the problems presented by these complications can by no means be regarded as settled. The most crying needs are for the adoption, if possible, of prophylactic measures that will limit the infection to the sinus and prevent the development of these and similar complications, and for the dissemination of knowledge

Fig. 1 (case 1, July 2, 1939).—Extensive osteomyelitis involving the entire right half of the frontal bone.

regarding this condition beyond the confines of these two most interested groups of specialists to the entire medical profession.

As a basis for this discussion we have chosen three cases of fulminating frontal sinusitis complicated by cranial or intracranial infections, and one case of osteomyelitis of the frontal bone and intracerebral abscess of different origin. Typically, all three cases of sinusitis occurred in adolescents and all followed swimming.

REPORT OF CASES

CASE 1.—*R. C., 16 year old boy; swimming April 17, 1939; almost immediate development of right frontal headache, edema of right side of forehead and swelling of eyelids; April 21 stiff neck; May 16 left-sided convulsions; diplopia; headache and vomiting; July 1 comatose; admitted July 2; right frontal sinusitis, osteomyelitis of frontal bone, abscess right frontal lobe; repeated operations; recovery.*

R. C., a boy aged 16 years, was first admitted to the University of Chicago Clinics Sunday, July 2, 1939, at 11:30 a. m. in a stuporous condition. According to his mother, he went

From the Division of Neurosurgery of the University of Chicago Clinics.
Read before the Chicago Laryngological and Otological Society, Jan. 8, 1940.

1. We are well aware that there are other less common complications of frontal sinusitis, such as subdural abscess, sinus thrombosis and meningitis, and also that similar complications may arise from chronic frontal sinusitis particularly following surgical intervention. However, only confusion and misunderstanding can arise from a discussion of the complications of chronic and acute sinusitis together in spite of their similarity, and we have chosen to refer only to the latter.

swimming April 17, 1939. The following day he complained of a right frontal headache; within the next twenty-four hours the pain became very severe, and a swelling appeared in the center of the forehead which soon spread to both upper eyelids and to the right half of the forehead. Local hot applications and some "pills" were prescribed but the condition grew steadily

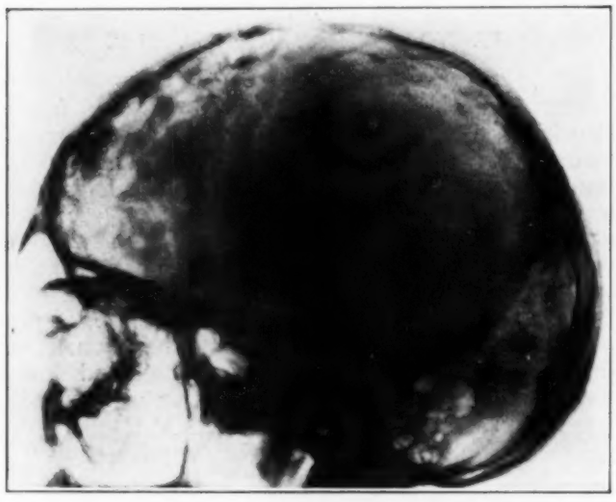


Fig. 2 (case 1, July 2, 1939).—Lateral view. Osteomyelitis extends back to the coronal suture.

worse. By April 21 he was also complaining of stiffness of his neck. On the 26th he was admitted to another hospital, where he remained until May 8. During this period an incision was made in the right upper eyelid and an amber fluid drained. Following this incision the swelling of the left upper eyelid disappeared but the right eye remained closed.

May 16, approximately one month after the onset, he began to have localized clonic convulsive seizures involving the left side of the face and left arm. Diplopia was present whenever the right eye was held open, and the headache and stiffness of the neck continued. June 5 roentgenograms taken by the family physician were said to have shown osteomyelitis of the right frontal bone. June 20 he suddenly lost consciousness and subsequently vomited. July 1 he became drowsy and at noon lapsed

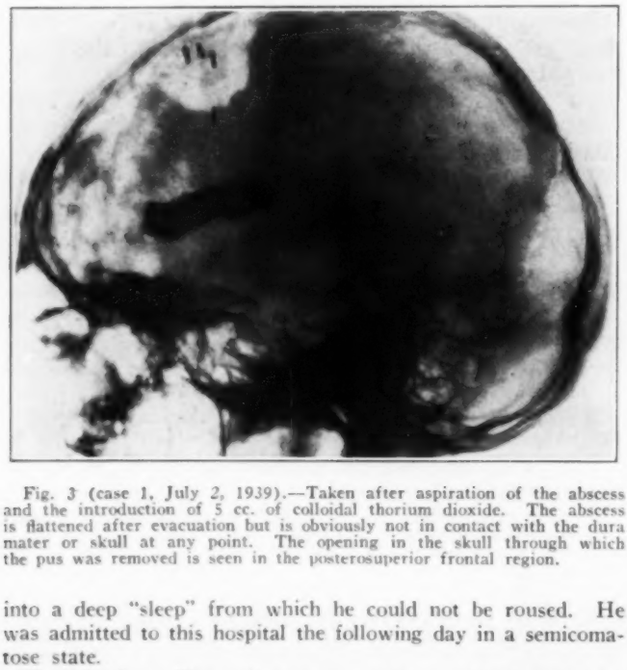


Fig. 3 (case 1, July 2, 1939).—Taken after aspiration of the abscess and the introduction of 5 cc. of colloidal thorium dioxide. The abscess is flattened after evacuation but is obviously not in contact with the dura mater or skull at any point. The opening in the skull through which the pus was removed is seen in the posterosuperior frontal region.

into a deep "sleep" from which he could not be roused. He was admitted to this hospital the following day in a semicomatose state.

Examination.—The patient was poorly nourished and emaciated and in a semicomatose condition. The temperature was 100 F. (rectally), pulse rate 72 and respiratory rate 24 per minute. The blood pressure was 118 systolic, 70 diastolic. On palpation the entire right half of the frontal bone was found to be roughened and there were small fluctuant swellings beneath the scalp. There was ptosis of the right upper eyelid. The pupils were equal but only the left reacted to light. There was bilateral papilledema with many hemorrhages about the disks. There was definite left facial weakness and there seemed to be left hemiparesis. There was some atrophy of the small muscles of the left hand. The tendon reflexes were all present, possibly slightly more active on the right side. Babinski's sign was present on the left.

He had leukocytosis with a count of 13,600. The blood contained 12 Gm. of hemoglobin and 4,620,000 red blood cells per cubic millimeter.

Roentgenograms of the skull revealed massive osteomyelitis of the entire right half of the frontal bone from the supra-orbital ridge to the coronal suture, which extended a slight distance across the midline to the left side (figs. 1 and 2).

It seemed obvious that the boy was suffering from an abscess of the right frontal lobe of the brain and extensive osteomyelitis of the right frontal bone, which had developed from a right frontal sinusitis.

Fig. 4 (case 1).—The entire right half of the frontal bone including the supra-orbital ridge and a small amount of bone to the left of the midline has been removed.

First Operation.—Relief from increased intracranial pressure being imperative, he was taken to the operating room. A short incision was made at approximately the level of the coronal suture on the right side and a trephine opening made in the underlying bone was enlarged to 2.5 by 4 cm. On incision the dura mater was found to be densely adherent to the underlying cerebral cortex. Immediately beneath the surface of the cortex was a superficial abscess from which 30 cc. of pus was evacuated. It was obvious that there was additional pathologic change. A blunt needle was inserted and at a distance of 4 cm. it encountered a second abscess from which 45 cc. of thin yellowish hemorrhagic pus was evacuated. Five cc. of colloidal thorium dioxide was injected into the abscess cavity in order that its size and position might be followed with x-rays (fig. 3). The wound was closed. Cultures of the pus all revealed hemolytic Staphylococcus aureus.

Almost immediately after the operation the patient roused from his stupor, responded and became quite restless. On examination he appeared to be totally blind.

Second Operation.—By July 6 his condition had improved so much that the necessary surgical treatment was undertaken. The old incision was extended medially and laterally within the hair line, and the scalp was reflected downward off the right frontal bone. There were much pus and many small bony sequestrums beneath the galea and the fragmented periosteum. The entire right half of the frontal bone was eroded, fenestrated and extensively infected. All of this involved bone, to the left beyond the midline, back to the coronal suture and laterally

beneath the temporal muscle, was removed with a rongeur (fig. 4). A large circular incision was made in the dura mater overlying the abscess to allow it to herniate out of the brain.

The patient soon became normally alert and cooperative. The left hemiparesis disappeared. July 13 70 cc. of pus was aspirated from the abscess and an additional 5 cc. of colloidal thorium dioxide was injected into it. The position of the abscess was then followed by daily roentgenograms. It was seen to shift laterally gradually and July 15 a third operation was undertaken.

Third Operation.—The old incision was reopened and the scalp was reflected forward. The encapsulated abscess projected about 2 cm. beyond the skull and was covered by a thin layer of necrotic cerebral tissue. It seemed possible to enucleate this abscess. However, the upper part of the abscess was unexpectedly thin and ruptured, releasing a large quantity of pus. The abscess cavity was then drained and the wound closed about the drains.

Fig. 5 (case 2).—Four months after extirpation of osteomyelitis of right half of frontal bone.

We were delighted to discover on the following day that the boy had some vision in his left eye. His condition and the vision gradually improved. He was discharged from the hospital September 5, at which time he was able to read ordinary newspaper print with his left eye although vision was largely limited to the nasal half of the field and he could only perceive light with the right eye. Ocular movements were full in all directions. Both pupils reacted to light.

He has since been followed in the outpatient department. His general condition has steadily improved although there has been little, if any, change in his vision since he was discharged from the hospital, and there has been no relapse except that two small sequestrums were removed from the region of the supra-orbital ridge on November 11. He is now anxious to return to school.

There is a considerable deformity of the right frontal region, which will eventually be corrected.

The disease in this instance was by far the most severe. There can be no question but that its severity was very materially increased by a marked delay in the institution of appropriate treatment, a delay of over two months after the first manifestations of intracranial involvement (a stiff neck), of over six weeks after the first evidence of cerebral involvement (the convulsions) and of almost a month after extensive osteomyelitis of the skull was demonstrated with the x-rays.

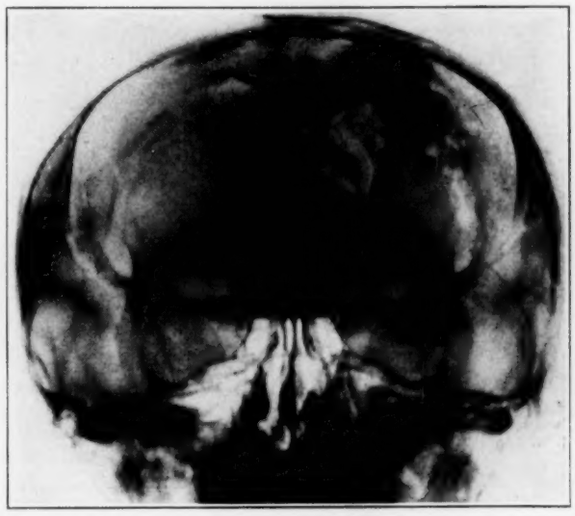


Fig. 6 (case 2, Sept. 8, 1939).—Osteomyelitis has invaded the right half of the frontal bone along the two main diploic venous channels. One extends directly upward from the sinus, the other extends upward from the malar process and then curves medially.

This case presents the typical clinical course of those in which an intracerebral abscess develops from the ear or from the paranasal sinuses. The intracranial infection is heralded by the general manifestations of increasing infection. The temperature rises, there is an increasing leukocytosis, the patient is obviously sicker—"toxic" is the word commonly applied. He may have a chill and almost invariably there is rigidity of the neck. This sudden exacerbation is usually of short duration, often only from one to three days. With the subsequent improvement the patient, his family and the doctor all heave an unjustified sigh of relief. After a variable

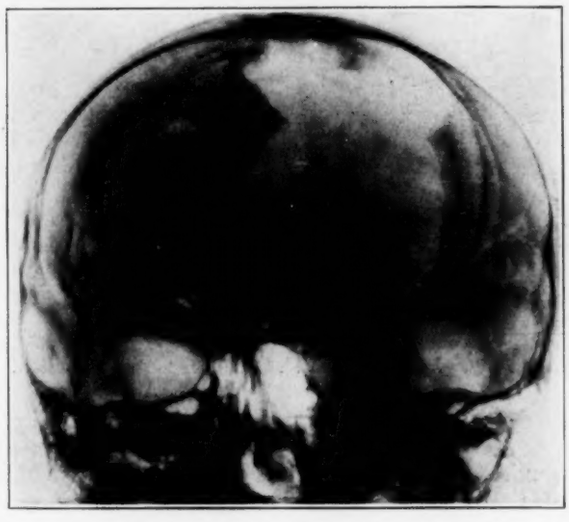


Fig. 7 (case 2).—Practically all of the right half of the frontal bone has been removed.

period of days or weeks, depending on the rapidity of the growth of the abscess, signs of cerebral or cerebellar involvement, as the case may be, appear. At this second stage the usual evidences of infection, fever, tachycardia and leukocytosis, are commonly either minimal or

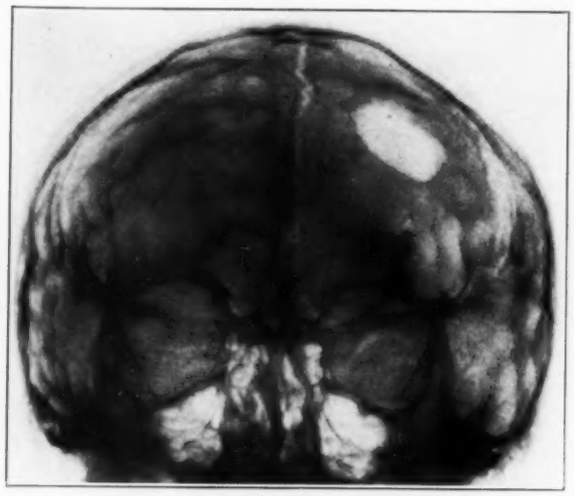


Fig. 8 (case 3).—The trephine opening is seen in the left frontal region. The abscess, now collapsed, is shown by the colloidal thorium dioxide which has been injected into it. There is no osteomyelitis present.

absent. Either simultaneously with or shortly after the appearance of this second stage evidences of increasing intracranial tension, headache, vomiting and choking of the optic disks, develop. If adequate treatment directed

Fig. 9 (case 3).—Lateral view showing the location of abscess.

toward the abscess itself has not already been instituted it now becomes imperative if the more serious sequelae of blindness, stupor, coma and death are to be avoided.

This course of events is so constant and so significant as to diagnosis and treatment that it deserves to be far better known. It may not always be possible to prevent the development of abscesses of the brain, but their presence can usually be recognized and appropriate treatment instituted early enough to prevent death or blindness if one is merely familiar with this train of events.

The second case of our series presents a surprising similarity to the first except that, fortunately, the extending infection was confined to the frontal bone.

CASE 2.—*F. D., 12 year old girl; dived in water feet first Aug. 6, 1939; immediate pain at root of nose; August 13 swelling right eye; August 26 roentgenograms revealed osteomyelitis; admitted September 8; immediate radical excision of osteomyelitis; rapid recovery.*

F. D., a girl aged 12 years, was referred to the University of Chicago Clinics by Dr. M. M. Hipskind of Chicago.

Aug. 6, 1939, she had gone swimming. She dived in feet first and immediately thereafter complained to her father of pain at the root of the nose. August 8 she complained of nasal obstruction. On the 10th she was sleepy and had a low grade fever. On the 12th she complained of pain over the right frontal sinus and on the 13th a swelling appeared at the inner angle of the right eye and grew progressively worse until the eye was swollen shut. The oral temperature was 101.6 F. The following day both eyes were swollen shut. Roentgenograms taken August 18 revealed some clouding of all of the paranasal

Fig. 10.—Normal skull of a boy of 10 years. The frontal diploic vein is most developed on the left side, while the anterior temporal veins are well seen on both sides. Compare with the course of the osteomyelitis in case 2, figure 5.

sinuses. Those made August 26 revealed an osteomyelitis of the right supra-orbital ridge, while the films exposed August 29 and September 6 revealed a gradual extension of the osteomyelitic process.

She was admitted to the University of Chicago Clinics September 8. Examination revealed edema of the right frontal region with several elevated fluctuant areas. The right upper eyelid was swollen and inflamed. There was paralysis of the right superior rectus muscle. The optic disks were normal in

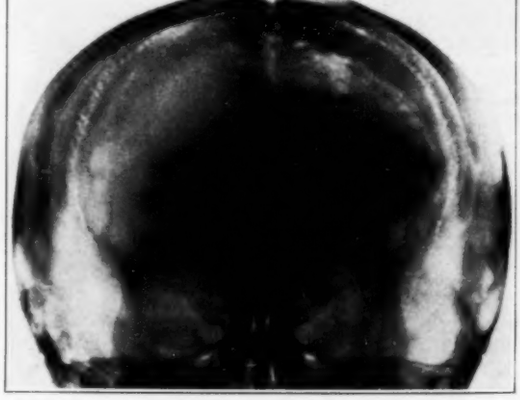


Fig. 11 (case 4).—Area of osteomyelitis along the course of the left anterior temporal diploic vein (to be compared with fig. 10).

appearance. No rigidity of the neck or other abnormal neurologic feature was noted. The temperature was 37.8 C. (100 F.), pulse rate 100 and respiratory rate 24. The blood examination revealed 6,200 leukocytes, 4,550,000 erythrocytes and 90 per cent hemoglobin.

Roentgenograms of the skull revealed two areas of osteomyelitis extending upward into the right frontal bone from the

frontal sinus. One was just lateral to the midline and followed the right frontal diploic vein. The other was higher and farther lateral and followed the anterior temporal diploic vein (fig. 6).

A diagnosis of osteomyelitis of the frontal bone on the right side was made, and the patient was taken to the operating room.

Operation.—September 8 a curved incision was made just back of the hair line, and the scalp was reflected downward off the right frontal bone. There was a small amount of pus and granulation tissue between the scalp and the bone in several places. The bone was roughened and in several places eroded through to the dura mater. Practically all of the right half of the frontal bone, including the walls of the frontal sinus and the supra-orbital ridge and extending back to the coronal suture, was removed before healthy bone was reached (fig. 7). There was a moderate-sized extradural collection of pus and granulation tissue beneath the more medial area of osteomyelitis. Two soft rubber drains were inserted beneath the scalp and the wound was closed.

Postoperative Course.—She made a rapid recovery and was discharged September 25. Except for the removal of a small localized area of infected bone overlooked at the first operation and subsequently demonstrated by x-rays she has remained in perfect health. There is only a very slight deformity in the right frontal region (fig. 5). Roentgenograms of the skull made Jan. 2, 1940, revealed definite evidence of beginning of regeneration of bone at the site of the defect. This regenerated bone could also be palpated. To date, June 17, 1940, this child has remained in perfect health and regeneration of the bone is continuing rapidly.

In contrast with the first case there was far less delay here. However, the avoidance of a severe intracranial infection must be attributed more to good fortune than to prompt action; for the month that elapsed between the onset of the sinus infection early in August and the removal of the infected bone in September was more than sufficient, as case 1 adequately shows, for the cerebrum to have been invaded.

Whereas acute fulminating sinusitis in the second case was complicated by osteomyelitis of the frontal bone without an associated brain abscess, the third case presents a brain abscess without any osteomyelitis.

CASE 3.—*M. B., 14 year old boy; swimming June 11, 1939; almost immediate severe left frontal headache; subsequent swelling left upper eyelid; continuous headaches; July 4 generalized convulsion; persistent vomiting; September 10 dizziness, diplopia, blurred vision; admitted September 20; right frontal lobe abscess; drained; recovered.*

M. B., a boy aged 14 years, was referred to the University of Chicago Clinics by Dr. Thomas Krause of Rockford, Ill.

June 11, 1939, he went swimming and got some water in his nose. That night a severe headache developed in the left frontal region. The headaches continued and one week later the left upper eyelid became swollen. A diagnosis of frontal sinusitis was made, but on endonasal drainage no pus was obtained. Subsequently the left upper eyelid was incised and there was free drainage for ten days, after which the incision healed spontaneously. The headaches, however, continued, and the pain radiated around the head and down into the neck. July 4 he became unconscious, had a generalized convulsion and later vomited. Subsequently vomiting recurred, gradually increasing in frequency. The headaches gradually shifted to the right frontal region. About September 10 he began to have attacks of dizziness and diplopia and the vision became blurred. At no time did he have more than 1 degree F. of fever.

He first came under the care of Dr. Krause September 17, when he was admitted to the Rockford Hospital. At that time ophthalmoscopic examination revealed severe papilledema bilaterally. On lumbar puncture the spinal fluid pressure was 40 mm. of mercury. The fluid contained 59 cells per cubic millimeter, 55 per cent of which were polymorphonuclear leukocytes and 40 per cent lymphocytes. The blood contained 11,300 white blood cells. He was transferred to the University of Chicago Clinics September 20.

Examination.—The temperature was 37.6 C. (99.7 F.), pulse rate 108, respiratory rate 22 and blood pressure 96 systolic, 56 diastolic. The boy was thin and underdeveloped for his age. The left upper eyelid was slightly swollen and contained a well healed scar. No abnormality of the heart, lungs or abdomen could be detected. There was marked bilateral papilledema with numerous hemorrhages and exudates. The visual fields were full to gross testing. Ocular movements were full. The left pupil was slightly larger than the right and both reacted sluggishly to light. There was a slight left lower facial weakness, most marked on smiling. On phonation the soft palate moved upward and to the right. Muscular strength, coordination and sensation were intact in all four extremities. The tendon reflexes were all active, though slightly more so on the left side. The abdominal reflexes were less active on the left, and Babinski's sign could at times be elicited on the left side. Station and gait were normal but he was more awkward on attempting to hop on the left leg. There was slight rigidity of the neck.

Examination of the blood revealed 10,900 white blood cells, 16 Gm. of hemoglobin and 5,300,000 red blood cells (all values possibly attributable to dehydration). The Wassermann and Kahn tests on the blood were negative. Roentgenograms of the skull revealed no evidence of sinusitis or osteomyelitis, but there was a moderate separation of the sutures of the cranial vault.

Abscess of the right frontal lobe secondary to left frontal sinusitis was diagnosed.

First Operation.—September 21 an incision was made just posterior to the hair line in the right frontal region. A trephine opening was made and enlarged with a rongeur to 3 cm. in diameter. A stellate incision was made in the dura mater, and the subdural space was packed with gauze. A blunt needle encountered a thick-walled abscess at a depth of 3 cm. from which 40 cc. of greenish pus was evacuated. A small quantity of colloidal thorium dioxide was injected in order that we might follow the abscess roentgenographically (figs. 8 and 9).

The patient was subsequently relieved of the headaches and vomiting. The subdural packing was removed in two days.

Second Operation.—September 27 the wound was reopened. The necrotic cerebral tissue overlying the abscess was removed with suction, disclosing the abscess 1 cm. beneath the surface of the cortex. The abscess was incised and evacuated. A firm rubber drain 1 cm. in diameter was inserted, and the remainder of the cavity was packed with gauze.

The patient's condition gradually improved and he was discharged from the hospital in excellent condition November 25.

It is doubtful in this case whether an accurate localizing diagnosis could have been made at an earlier date without the assistance of pneumo-encephalography.[2] Yet had relief of the increased intracranial pressure been much longer delayed, serious impairment of vision would most certainly have resulted.

Although the frontal lobe abscess is usually found on the same side as the frontal sinusitis, that such is not invariably the case is well shown by the example just presented. A somewhat similar spread of the infection by the cranial and intracranial venous system is also illustrated by case 4, to be presented later.

PATHWAY OF EXTENSION

Case 1 was much too far advanced when we first saw the patient to give any clue as to how the infection had spread from the sinus, but cases 2 and 3 are far more instructive.

It has long been recognized that there are several potential avenues by which the infectious organisms may invade the frontal bone and the intracranial cavity. Direct spread by way of the diploic spaces was recognized early by Turner [3] and subsequently by numerous

2. Although practically no observations have been reported relative to the value of electro-encephalography in the localization of cerebral abscesses, it would seem more than likely that this procedure may prove of very great value in the diagnosis of these conditions in which accurate localization is too often difficult.

3. Turner, A. L.: The Operative Treatment of Chronic Suppuration in the Frontal Sinus, Edinburgh M. J. **17**: 239-257, 1905.

other writers. Spread along the perineural sheaths of the olfactory nerves, surely a rare channel, has been cited by Courville and Rosenwold.[4] The pathway most commonly indicted is the diploic veins which spread upward from the region of the frontal sinus (Courville and Rosenwold,[4] Furstenberg,[5] Mosher,[6] Mosher and Judd,[7] Behrens[8]). We agree with these authors that these venous channels are usually responsible and with Courville[9] that spread of infection from the ears and other areas of the skull is commonly by a similar route.

Spreading upward from the region of the frontal sinus into the frontal bone and to emissary veins which penetrate to the superior longitudinal sinus or its immediate tributaries are two diploic veins, the frontal and the anterior temporal. These are well shown in the roentgenogram of a child's skull in which no infection existed (fig. 10). Although the configuration of these diploic veins varies from case to case they constantly occupy the same general position. The frontal diploic vein passes upward from the region of the frontal sinus a short distance lateral to the midline of the skull. The anterior temporal diploic vein passes upward from the region of the malar process, then curves medially parallel to and a short distance anterior to the coronal suture. How either one or both of these channels act as pathways for the infection is beautifully shown in the roentgenograms from case 2 (fig. 5). There the process has been caught before the infected areas which have developed along these two channels have coalesced, and each is clearly shown.

It seems safe to assume that osteomyelitis develops only when thrombosis occurs and that in some instances infection may pass through these veins into the superior longitudinal sinus and thence, retrograde, into the ipsilateral or contralateral cerebral hemisphere without the venous wall becoming infected. In such a case a brain abscess appears without the development of an intervening osteomyelitis, as in case 3.

In case 4, which also illustrates these points, both the osteomyelitis and an abscess developed. This, like case 3, clearly shows that the abscess may lie in either hemisphere regardless of the side of either the sinusitis or the osteomyelitis. And it further demonstrates that an infection spread by this means from an osteomyelitis of the frontal bone need not necessarily lodge in the usual site, well forward in the frontal lobe, but may involve more posterior parts of the hemisphere.

CASE 4.—*M. G., 3 year old girl; July 26, 1936, left subtemporal abscess; Sept. 6, 1936, osteomyelitis, along left anterior temporal diploic vein, excised; September 15 right posterior frontal lobe abscess; drained; recovered.*

M. G., a girl aged 3 years, was referred by Dr. Frank Greer, of Chicago, to the University of Chicago Clinics. She was admitted July 29, 1936. Two weeks before admission a swelling had developed in the left temporal fossa, apparently secondary to a stye on the left upper eyelid and a fall in which the region of the left eye was injured. The only other complaints were a low grade fever (not over 102 F.), a temporary left external rectus palsy and irritability.

First Operation.—Examination, including x-ray study of the skull, revealed only a fluctuant swelling in the right temple. This was incised disclosing an abscess beneath the temporal muscle which healed promptly after it was drained. Cultures showed hemolytic Staphylococcus aureus.

During the postoperative period it was thought on several occasions that there was slight blurring of the margins and elevation of the optic disks. However, as there were no other abnormalities, as the general condition remained excellent and the disks did not show any progressive changes she was discharged August 26, after rather prolonged observation.

Soon thereafter a small swelling developed beneath the scalp just at the hair line in the left frontal region. She was readmitted September 6. Roentgenograms of the skull revealed an unquestionable area of osteomyelitis in the left frontal bone along the course of the anterior temporal diploic vein (fig. 11). This extended up to the region of the superior sagittal sinus. Physical and neurologic examinations, except for the swelling in the frontal region and the healed temporal scar, revealed nothing abnormal. The optic disks were unchanged.

Second Operation.—September 8 the osteomyelitic area was completely removed. She continued well until September 13, when chickenpox developed.

September 15 she complained of headache and vomited. Examination revealed definite bilateral papilledema and left hemiparesis with increased tendon reflexes and Babinski's sign on the left but no demonstrable sensory changes.

Third Operation.—A diagnosis of a brain abscess in the right posterior frontal region was made. A trephine opening was made in this region September 16, and 30 cc. of pus was aspirated from an abscess which was encountered at a depth of 6 cm. Cultures showed hemolytic Staphylococcus aureus.

Subsequently the abscess was aspirated repeatedly but finally had to be drained. After several operations the infection was finally eradicated. Although a moderate hemiparesis persists, she continues well according to information recently received from Dr. Claude C. Coleman, of Richmond, Va., and her father.

This case illustrates with almost diagrammatic clarity the pathway followed by the infection. From the stye on the eyelid it spread, perhaps as the result of trauma, to beneath the left temporal muscle; there it produced an abscess and then invaded an emissary vein and spread to the anterior temporal diploic vein, part of which became thrombosed, giving rise to an area of osteomyelitis just anterior to the coronal suture (fig. 11). After a brief interruption it continued onward into the superior longitudinal sinus, backward to and down one of the rolandic veins, and was deposited in the substance of the opposite (right) cerebral hemisphere; in this nidus it developed into a localized cerebral abscess.

It is obvious from a study of these cases that any procedure aimed at the prevention of a cerebral abscess must not only eradicate the focus of infection but also interrupt the venous channels which form an open and continuous pipeline into the cerebral substance.

PREVENTION

Of all the problems arising from acute frontal sinusitis, that of prevention is at the same time the most pressing, the least adequately understood and the most difficult. It divides itself into two phases: (1) prevention of the sinusitis and (2) treatment of the sinusitis, once it develops, adequate to prevent the appearance of complications.

From our own experience and from a review of the literature we agree with Mosher[10] that "Our worst cases of frontal sinus infection and osteomyelitis have followed swimming." This is due, as Taylor[11] has

4. Courville, C. B., and Rosenwold, L. K.: Intracranial Complications of Infections of Nasal Cavities and Accessory Sinuses, Arch. Otolaryng. **27**: 692-731 (June) 1938.
5. Furstenberg, A. C.: Osteomyelitis of the Skull: The Osteogenetic Process in the Repair of Cranial Defects, Ann. Otol., Rhin. & Laryng. **40**: 996-1012 (Dec.) 1931.
6. Mosher, H. P.: Osteomyelitis of the Skull, Tr. Am. Laryng. **59**: 123, 1937.
7. Mosher, H. P., and Judd, D. K.: An Analysis of Seven Cases of Osteomyelitis of the Frontal Bone Complicating Frontal Sinusitis, Laryngoscope **43**: 153-212 (March) 1933.
8. Behrens, H. C.: Osteomyelitis of the Skull of Otitic and Paranasal Sinus Origin, Arch. Otolaryng. **25**: 272-304 (March) 1937.
9. Courville, C. B.: Pathology of the Central Nervous System, Mountain View, Calif., Pacific Press Publishing Association, 1937, pp. 131-133.
10. Mosher, H. P.: Osteomyelitis of the Frontal Bone, J. A. M. A. **107**: 942-946 (Sept. 19) 1936.
11. Taylor, H. M.: Otitis and Sinusitis in the Swimmer, J. A. M. A. **113**: 891-894 (Sept. 2) 1939.

pointed out, to two factors: "Foreign bacteria may gain entrance to the deeper portions of the nasal apparatus and the conjoined structures, or bacteria normally and constantly in this region may be allowed, by a lowered resistance on the part of the swimmer, to multiply to pathologic proportions."

Unfortunately this phase of the problem cannot be solved by the very best of bacteriologic control of swimming places by public health authorities. They cannot sterilize the swimmer's own nasal passages. It is to be hoped that educational efforts by members of the profession such as those by Taylor [11] and by Taylor and Dyrenforth [12] will encourage the teaching of proper breathing, the use of suitable devices, such as nose clips and ear plugs, while swimming, and the avoidance of chilling. Although such education may ultimately be expected to reduce the incidence of sinus infections, it is far too much to expect that the problem can be abolished by such means. "The old swimmin' hole" is not always conducive to the care requisite to these needs, nor are swimming and diving responsible for all cases of fulminating frontal sinusitis.

We turn then to the problem of the limitation of the infection to the sinus. We realize that not being rhinologists we tread here on unfamiliar ground, perhaps unwanted. In the rhinologic literature, particularly the standard textbooks, one finds little help. Most authorities appear content to "shut the door after the horse has been stolen" and advise treatment which could be adequate to drain the infected sinus only after evidence of osteomyelitis, meningitis or an abscess has appeared (Ballenger and Ballenger,[13] Lederer,[14] Turner,[15] Thomson and Negus [16]). Others [17] largely ignore the problem. Obviously treatment directed toward eradicating the infection in the sinus is, in the main, useless once the infection has spread to the frontal bone, the brain or the meninges. If the production of adequate surgical drainage of the sinus is ever indicated, if it is of any value in preventing the development of cranial and intracranial infection, it obviously must be applied, if it is to be effective, before the infection has spread.

It appears to us that in fulminating cases of frontal sinusitis associated with pain, tenderness, local swelling and fever, particularly those cases which follow swimming, adequate external drainage of the infected sinus becomes imperative on making the diagnosis. In taking this position we appear to have the support of Hastings,[18] Adson and Hempstead,[19] Williams and Heilman [20] and certainly of the rhinologic profession's first authority on the subject, Dan McKenzie.[21] We wish to emphasize two qualifications to our statement.

First, we are referring only to acute fulminating frontal sinusitis, particularly those instances that follow swimming, and do not wish to support the position apparently taken by Woodward,[22] who seems to advise external surgical drainage for all cases, both acute and chronic, of frontal sinusitis.

Second, we do not presume to tell the rhinologists what constitutes adequate external drainage of the infected sinus. It does appear to us, however, that endonasal drainage is wholly inadequate for this purpose. It is too much to expect that the nasofrontal duct, which is "not infrequently . . . constricted and sinuous due to the encroachment of some of the frontal anterior ethmoidal cells" (Jackson, Coates and Jackson,[17] p. 25) and always edematous and partly or completely obliterated as a result of the infection, will provide adequate drainage, even though partial resection of the middle turbinate, shrinkage of the mucosa or other endonasal procedures are also carried out. We would emphasize with Adson and Hempstead [19] that "It is obvious that early drainage of a suppurating frontal sinus will preclude extension of the infection to the frontal bone and brain." But such drainage must be prompt, must be obtained before any extension of the infection beyond the sinus has occurred. And in these acute infections which follow swimming such extension occurs amazingly early, as our cases demonstrate.

It may be objected that such early surgical intervention in the presence of a fulminating infection will only serve to spread the infection and prevent its being localized. We would call attention to the fact that one is dealing here with an infection that does not tend toward spontaneous localization and spreads because it is confined to a bony cavity, the sinus, without adequate drainage. It is reasonable to suppose, therefore, that drainage may prevent the invasion of the venous system by the infection, which is present in the sinus under pressure, by providing it with an adequate channel of egress, which will relieve the pressure and provide for the removal of infectious material. We would further call attention to the fact that in each of the three cases recorded here the infection spread spontaneously and without any intervening or precipitating surgical procedures, and furthermore that it spread very early. Accordingly it is not to be expected that drainage of the sinus will be effective unless performed early, before any dissemination of the infection has begun, or that it will be able to control the infection in all cases irrespective of the virulence of the infectious agent or the patient's condition. Such would be contrary to all other therapeutic experiences.

TREATMENT OF OSTEOMYELITIS

McKenzie's original dictum that "once progressive osteomyelitis has set in, the only chance of saving the patient lies in the immediate and entire removal of the diseased bone" [21] has at last been accepted by practically all neurologic surgeons (Fincher [23]) and most rhinologists (Furstenberg,[5] Mosher,[6] Mosher and Judd,[7] Mosher,[10] Woodward,[22] Skillern,[24] McKinney,[25] Wilensky,[26] McKenzie [27]). However, some still persist in

12. Taylor, H. M., and Dyrenforth, L. Y.: Chilling of the Body Surfaces: Its Relationship to Aural and Sinus Infections, J. A. M. A. **111**: 1744-1746 (Nov. 5) 1938.
13. Ballenger, W. L., and Ballenger, H. C.: Diseases of the Nose, Throat and Ear, Philadelphia, Lea & Febiger, 1938.
14. Lederer, F. L.: Diseases of the Ear, Nose and Throat, ed. 2, Philadelphia, F. A. Davis Company, 1939.
15. Turner, A. L.: Diseases of the Nose and Throat and Ear, Baltimore, William Wood & Co., 1936.
16. Thomson, St. Clair, and Negus, V. E.: Diseases of the Nose and Throat, ed. 4, New York and London, D. Appleton-Century Company, 1937.
17. Jackson, Chevalier; Coates, G. M., and Jackson, C. L.: The Nose, Throat and Ear and Their Diseases, Philadelphia, W. B. Saunders Company, 1930.
18. Hastings, Hill: Osteomyelitis Associated with Frontal Sinusitis, Arch. Otolaryng. **13**: 181-186 (Feb.) 1931.
19. Adson, A. W., and Hempstead, B. E.: Osteomyelitis of Frontal Bone Resulting from Extension of Suppuration of Frontal Sinus, Arch. Otolaryng. **25**: 363-372 (April) 1937.
20. Williams, H. L., and Heilman, F. R.: Spreading Osteomyelitis of the Frontal Bone Secondary to Disease of the Frontal Sinus, Arch. Otolaryng. **25**: 196-207 (Feb.) 1937.
21. McKenzie, Dan: Diffuse Osteomyelitis from Nasal Sinus Suppuration, J. Laryng., Rhin. & Otol. **28**: 7-25; 79-84; 129-137, 1913.
22. Woodward, F. D.: Osteomyelitis of the Skull, J. A. M. A. **95**: 927-930 (Sept. 27) 1930.
23. Fincher, E. F.: Osteomyelitis of Skull, South. Surgeon **6**: 53-74 (Feb.) 1937.
24. Skillern, S. R.: Osteomyelitic Invasion of the Frontal Bone Following Frontal Sinus Disease, Ann. Otol., Rhin. & Laryng. **48**: 392-411 (June) 1939.
25. McKinney, Richmond: Osteomyelitis of the Frontal Bone, Arch. Otolaryng. **28**: 1-9 (July) 1938.
26. Wilensky, A. O.: Association of Osteomyelitis of the Skull and Nasal Accessory Sinus Disease, Arch. Otolaryng. **15**: 805-833 (June) 1932.
27. McKenzie, Dan: Further Observations on Spreading Osteomyelitis of the Skull, J. Laryng. & Otol. **42**: 293-308, 1927.

a more conservative attitude, insisting that osteomyelitis of the skull should be treated like osteomyelitis anywhere else in the body,[28] that is by drainage and the removal of sequestrums when they form (Hastings,[18] Williams and Heilman,[20] Skillern[29]). This view of cranial osteomyelitis completely overlooks the important and essential differences between such infection here and in other bones of the body. As both Fincher[23] and Adson and Hempstead[19] have pointed out, osteomyelitis of the skull either untreated or inadequately treated commonly results in abscesses within the brain. Accordingly the only defensible treatment of osteomyelitis of the skull is early diagnosis and complete removal of all infected bone with interruption of the venous channels in the bone which bear the infection inward.

It has been maintained by some[29] that there are two types of osteomyelitis of the frontal bone secondary to frontal sinusitis: (1) a localized and (2) a diffuse spreading type. We entertain serious doubts as to whether the slowly progressing localized type ever develops secondarily to an acute fulminating sinusitis. In any event we agree with Furstenberg and Mosher that the differentiation between a localized and a spreading, diffuse osteomyelitis is of no practical value to the surgeon as it is invariably a diagnosis in retrospect. The diagnostician does not exist who has the prophetic vision to foresee whether the process, which he is called on to eradicate in the acute stage, will remain localized or will spread. All osteomyelitis of the cranial vault should be removed completely as soon as the diagnosis is made.

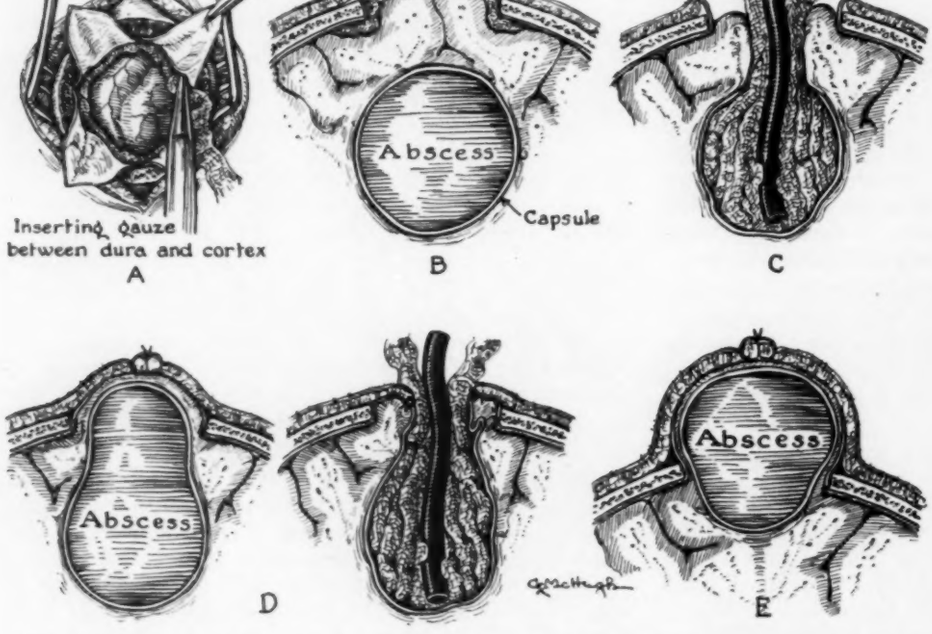


Fig. 12.—Treatment of brain abscess. First stage (*A* and *B*): A trephine opening is made over the abscess and enlarged to 3 cm. in diameter. The dura mater is incised and the subdural space is packed with selvedged gauze soaked in a weak solution of iodine. The gauze is removed after two days.

Second stage (*C*): The usual appearance. The cortex overlying the abscess is removed and the abscess is evacuated, drained and packed. (*D*) When the abscess is partially herniated it may be marsupialized. (*E*) Occasionally it will be found to have herniated out of the skull and can then be removed in toto.

And that raises the question of how to recognize the development of this condition. As Mosher has repeatedly pointed out, and as the general surgeons and roentgenologists have known for many years, osteomyelitis does not give roentgenographic evidence of its presence for at least ten to fourteen days after the onset. Thus if the condition is to be recognized and treated early it becomes impossible to wait for or rely on the roentgenograms. Fortunately there is one constant and pathognomonic sign of osteomyelitis of the frontal bone, an edema of the forehead extending upward from the supra-orbital ridge. Such a development is positive in its implications both as to diagnosis and as to treatment.

How the operation is to be performed and what incision is to be used are matters of minor importance. Each operator should choose that incision and those instruments best fitted to his hands, although like most other neurosurgeons we admit to an unconquerable distaste for and fear of the mallet and chisel. The only requirements are that the infected bone be entirely removed without lacerating the dura mater, with a minimum of trauma to other tissues and with as little hemorrhage as possible.

TREATMENT OF BRAIN ABSCESS

Each neurosurgeon has his own special technic for dealing with abscesses of the brain. Recently we have presented ours.[30] It undoubtedly has no great advantages over any other but in our hands has proved reasonably successful. Briefly it is as follows: The abscess having been localized, a trephine opening is made in the skull overlying it and enlarged to approximately 3 cm. in diameter. A stellate incision is made in the exposed dura mater, and the subdural space about the margins of the opening is packed with selvedged gauze soaked in a weak solution of iodine (fig. 12). A blunt needle is then inserted through the cerebrum into the abscess and as much pus as possible is allowed to escape. The needle is withdrawn and the wound closed, bringing the end of the gauze out through the incision. Two days later the gauze is all withdrawn and approximately a week later the wound is reopened. In the interval the abscess may be aspirated, if necessary. When the wound is reopened the cerebral tissue overlying the abscess is removed by means of suction or with an electric cautery, and the abscess is incised and drained with large (diameter 1 cm.) firm rubber tubes.

There is only one point in the treatment of these abscesses which merits further discussion. Whenever possible the abscess should be approached through

28. Dixon, O. J.: Diffuse Cranial Osteomyeltis Complicating Frontal Sinusitis, Ann. Otol., Rhin. & Laryng. **43**: 16-38 (March) 1934.

29. Skillern, R. H.: An Extensive Case of Acute Osteomyelitis of the Frontal and Superior Maxillary Bones Complicating Sinusitis, Operation, Apparent Recovery, Sudden Death, Ann. Otol., Rhin. & Laryng. **38**: 1022-1032 (Dec.) 1929.

30. Bucy, P. C.: The Treatment of Brain Abscess, Ann. Surg. **108**: 961-979 (Dec.) 1938.

uninfected tissue. All too frequently rhinologists and otologists operating in an infected field break the most invincible barrier to infection that the human body has —the dura mater. If the meningeal spaces have been obliterated this is, of course, without danger; but all too frequently such is not the case. Incision of the dura mater in an infected field is based on an erroneous assumption—that brain abscesses are produced by direct invasion of the brain through the dura mater. In fact, as we have earlier pointed out, the infection usually enters the brain through the venous system. Incision of the protecting dura mater in an infected field in the absence of a brain abscess exposes the leptomeninges directly to the infectious organisms and invites the development of meningitis. Even when an abscess is present, elevating the intracranial tension and compressing the meningeal spaces, the danger is by no means abolished and it would appear that this unwise procedure may account, in part at least, for the far too high mortality from this condition.

REGENERATION

Although regeneration of bony defects of the skull has long been known to occur, there is little available literature dealing with this subject. Furstenberg [5] is one of the few to present any considerable number of cases and even he, unfortunately, gave few details. He studied eight cases in which bone had been removed from the cranium because of osteomyelitis. "In each of the eight patients now living and well, there is perfect obliteration of the cranial defect through the medium of regenerated bone." Most other authors, like Mollison,[31] report a single instance and that briefly. The entire problem is badly in need of a thoroughgoing investigation with a large number of cases.

It is, however, our impression, along with that of many other neurosurgeons, that the defects secondary to the removal of osteomyelitic foci usually are repaired by bony regeneration, and that defects made by removing infected bone show a much greater tendency toward regeneration than bone removed with sterile technic, as in cases of brain tumor.

CONCLUSIONS

Three cases of cranial, intracranial and combined infection secondary to acute infection of the frontal sinus which followed swimming and one case in which such infection followed trauma to a stye were chosen as a basis for discussion. From these cases and a review of the literature it is concluded that:

1. The infection usually spreads to the frontal bone and invades the brain by way of the venous system.

2. Prevention of the fulminating frontal sinusitis, osteomyelitis and brain abscess, which so often follow swimming, can in a measure be attained by instruction regarding proper breathing and the use of protective devices. However, in the main prophylactic measures must be directed toward prevention of the spread of infection from the sinus. It appears that this can be best obtained by prompt external surgical drainage in the acute fulminating cases.

3. Osteomyelitis of the skull should be treated by excision of all of the infected bone as soon as the diagnosis is made.

4. Brain abscess should be drained through an uninfected area of the skull, if possible, with due attention to prevention of infection of the meninges.

5. Defects made by removing infected bone from the skull are probably usually repaired by the spontaneous regeneration of bone.

31. Mollison, W. M.: Case Showing Re-Formation of Frontal Bone Removed Eight Years Ago for Acute Osteomyelitis, Proc. Roy. Soc. Med. (Sect. Laryngol.) **19** (pt. 3): 29 (Feb. 5) 1926.

ANESTHESIA AND LIVER INJURY

WITH SPECIAL REFERENCE TO PLASMA PROTHROMBIN LEVELS

S. C. CULLEN, M.D.
S. E. ZIFFREN, M.D.; R. B. GIBSON, PH.D.
AND
H. P. SMITH, M.D.
IOWA CITY

It is now a well established fact that patients with biliary fistulas or with chronic biliary tract obstruction do not absorb adequate amounts of vitamin K from the ordinary diet. Without absorption of this vitamin, prothrombin cannot be produced in the body and a marked tendency to bleed develops.

In many of these cases in which there are depleted reserves the prothrombin level is only slightly reduced prior to operation, but commonly it falls markedly after operation. This dangerous postoperative fall may be due to either of two factors: (1) excessive loss of prothrombin through hemorrhage at operation and through the postoperative formation of fibrin exudate in the margins of the wound and (2) interference with the manufacture of prothrombin by the liver. Such interference might result from decreased consumption of food or from injury to the liver. Such injury might be brought about by mechanical trauma at the time of operation or by absorption of toxic by-products from the operative site. Finally it might be produced by direct poisoning of the liver by the anesthetic agent employed.

Most workers [1] lean to the view that the anesthetic agent does produce sufficient liver injury to account for this postoperative fall in the prothrombin level.[1a] This view appears, however, to be mainly conjecture, for in published data all the complicating factors mentioned were constantly present. We here present our own observations, which, except in the case of chloro-

Aided by a grant from the John and Mary R. Markle Foundation. Funds for a technical assistant were supplied by the Graduate College, State University of Iowa.

Read before the Section on Miscellaneous Topics, Session on Anesthesia, at the Ninety-First Annual Session of the American Medical Association, New York, June 13, 1940.

From the Division of Anesthesiology, Department of Surgery, and the Department of Pathology, State University of Iowa College of Medicine, and the Pathological Chemistry Laboratory, University Hospitals.

1. Stewart, J. D.: Prothrombin Deficiency and the Effects of Vitamin K in Obstructive Jaundice and Biliary Fistula, Ann. Surg. **109**: 588-595 (April) 1939. Quick, A. J.: The Clinical Application of the Hippuric Acid and the Prothrombin Tests, Am. J. Clin. Path. **10**: 222-233 (March) 1940. Smith, H. P.; Ziffren, S. E.; Owen, C. A.; Hoffman, G. R., and Flynn, J. E.: The Jaundiced Bleeder: Control of Hemorrhage Through Vitamin K Therapy, J. Iowa M. Soc. **29**: 377-384 (Aug.) 1939. Rhoads, J. E.: The Relation of Vitamin K to the Hemorrhagic Tendency in Obstructive Jaundice with a Report on Cerophyl as a Source of Vitamin K, Surgery **5**: 794-808 (May) 1939. Butt, H. R.; Snell, A. M., and Osterberg, A. E.: Further Observations on the Use of Vitamin K in the Prevention and Control of the Hemorrhagic Diathesis in Cases of Jaundice, Proc. Staff Meet., Mayo Clin. **13**: 753-764 (Nov. 30) 1938.

1a. Warren and Rhoads, however, found that ether anesthesia in dogs failed to produce a prothrombin deficiency (Warren, Richard, and Rhoads, J. E.: The Hepatic Origin of the Plasma-Prothrombin Observations After Total Hepatectomy in the Dog, Am. J. M. Sc. **198**: 193-197 [Aug.] 1939).

form, tend to minimize the role of anesthetics in affecting the prothrombin level. The two stage titration technic of Warner, Brinkhous and Smith [2] was used to determine the plasma prothrombin level.

THE EFFECT OF CHLOROFORM ANESTHESIA

That chloroform anesthesia produces injury to the liver of animals has been known for many years. More recently it has been shown by Smith, Warner and Brinkhous [3] that owing to such injury there is a profound fall in the plasma prothrombin level.

TABLE 1.—*Chloroform Anesthesia: Plasma Prothrombin Levels*

Patient	Age	Operation	Duration of Anesthesia, Hours	Concentration of Anesthetic in Blood, Mg. per 100 Cc.*	Plasma Prothrombin Level, per Cent of Normal, Days After Operation						
					Before Operation	1	2	3	4	5	6
1	22	Hernioplasty	1	...	106	100	60	87	75	...	107
2	38	Hernioplasty	1½	...	100	77	..	79	86	91	89
3	25	Hernioplasty	1⅛	...	97	79	98	104	113	...	...
4	18	Hernioplasty	1⅛	18	90	86	81	79	115	82	...
5	20	Appendectomy	1	17	100	70	87	68	73	83	94
6	..	Repair of cleft palate	1¼	15	82	56	69	50	67	80	83.5
Average					96	78	79	79	88	84	93

* Analytic method for chloroform in blood: Two cc. of blood was discharged into 20 cc. of a 5 per cent solution of tartaric acid in 50 per cent alcohol and 10 cc. of distillate collected. One cc. of the distillate was diluted to 10 cc. with water, and 2 cc. of this was heated on the water bath for three minutes with 4 cc. of 20 per cent sodium hydroxide and 3.5 cc. of pyridine (Cole, W. H.: The Pyridine Test as a Quantitative Method for the Estimation of Minute Amounts of Chloroform, J. Biol. Chem. **71**: 173 [Dec.] 1926) with shaking. The sodium hydroxide layer was removed, the pyridine layer shaken with 12 per cent anhydrous sodium sulfate solution and removed and filtered. Trichloroacetic acid solution was used as a standard for the colorimetric comparison.

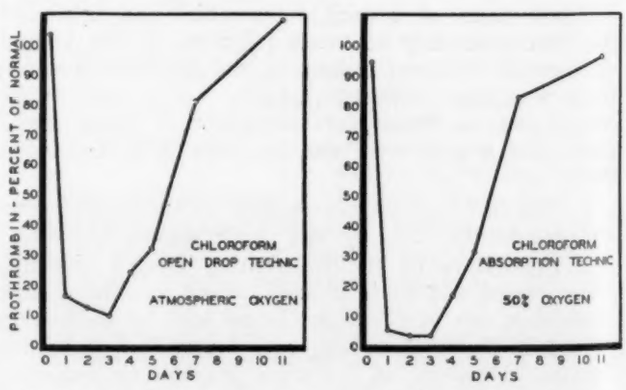
That chloroform is injurious to the human liver has been accepted on clinical and autopsy evidence. The observations given in table 1 show that the prothrombin level also is influenced and falls markedly even though the anesthesia is not unduly prolonged. None of the patients listed showed evidence of vitamin deficiency or of preexisting disease of the liver or biliary tract, and in no case was there any manipulation about the liver at the time of operation. Only one of the patients had an intraperitoneal operation; the others had repair of a hernia or a harelip. The anesthesia varied in length from an hour to an hour and a half. Most of the patients were maintained in from light to moderate anesthesia (first or second plane, third stage). In case 5 the anesthesia was maintained at a lower level (third plane, third stage) for brief periods. The chloroform levels in the blood were determined in these cases and were found to be from 15 to 18 mg. per hundred cubic centimeters of blood.

Prior to operation the prothrombin levels were within normal range in all cases, though in case 6 it was only 82 per cent of the normal control level. Following operation there was a fall in every case with a variation of from 11 to 40 per cent and an average fall of 18 per cent. In some cases the lowest level was reached within twenty-four hours; in others it was not reached until from forty-eight to seventy-two hours had elapsed. In a number of cases the plasma was slightly icteric at this time and in cases 5 and 6 the icterus was quite marked.

Recovery from the injurious effects of chloroform is usually evident on the third or fourth postoperative day and is typically complete within a week. Case 6 is the only one in which recovery was definitely delayed.

In five of the cases the chloroform was administered in a closed system by the absorption technic, the inhaled atmosphere containing at least 50 per cent of oxygen. In case 6, however, anesthesia was induced by the open drop technic and was then maintained by pharyngeal insufflation. A certain amount of obstruction and asphyxia was present. In this case the prothrombin fell to the low level of 56 per cent and there was oozing of blood from the operative site at this time.

Ravdin and his co-workers [4] have presented evidence to indicate that in dogs asphyxia aggravates the harmful effect of chloroform on the liver. When they administered chloroform in air, some asphyxia was present and liver necrosis was more evident than when the chloroform was administered in an atmosphere rich in oxygen. Under normal working conditions the use of oxygen is undoubtedly a desirable precaution, but we have found in experiments on dogs that by careful elimination of respiratory obstruction and depression there is no need for enriching the atmosphere with oxygen. To prevent obstruction we used a mask covered only by a thin layer of gauze. As a further precaution a catheter was placed through the larynx into the trachea. The accompanying chart shows results in a representative dog which received chloroform for an hour and a half along with a gaseous mixture rich in oxygen. A companion dog received chloroform for the same period by the open drop technic, including the necessary precautions to prevent asphyxia. The plasma prothrombin fell to approximately the same level and at approximately the same rate in the two dogs. The recovery periods were likewise similar. It is evident that oxygen in excess is beneficial only as far as it is needed to correct defective ventilation. Oxygen in excess of this does not minimize the injury to the liver.



Similarity in depression of plasma prothrombin levels in dogs given chloroform anesthesia by the open drop and absorption technics when care is taken with both technics to eliminate asphyxia.

Incidentally the curves of the chart illustrate the fact that the fall in plasma prothrombin is much greater in dogs than in man under equal conditions of anesthesia.

2. Warner, E. D.; Brinkhous, K. M., and Smith, H. P.: A Quantitative Study on Blood Clotting: Prothrombin Fluctuations Under Experimental Conditions, Am. J. Physiol. **114**: 667-675 (Feb.) 1936. Smith, Warner and Brinkhous.[3]

3. Smith, H. P.; Warner, E. D., and Brinkhous, K. M.: Prothrombin Deficiency and the Bleeding Tendency in Liver Injury (Chloroform Intoxication), J. Exper. Med. **68**: 801-811 (Dec.) 1937.

4. Goldschmidt, Samuel; Ravdin, I. S., and Lucké, Balduin: Anesthesia and Liver Damage: I. Protective Action of Oxygen Against the Necrotizing Effect of Certain Anesthetics on the Liver, J. Pharmacol. & Exper. Therap. **59**: 1-14 (Jan.) 1937.

THE EFFECT OF ETHER AND CYCLOPROPANE

There has been much interest in the possibility that ether, cyclopropane and other common anesthetic agents may likewise cause liver injury sufficient to produce the postoperative fall in prothrombin which is so commonly observed in the jaundiced bleeder. To study this problem we observed prothrombin levels in a number of cases in which operations were performed for various conditions. In all cases the anesthesia was administered by the absorption technic when an atmosphere containing at least 50 per cent of oxygen was used.

TABLE 2.—*Ether and Cyclopropane Anesthesia: Plasma Prothrombin Levels*

Patient	Age	Operation	Duration of Anesthesia, Hours	Concentration of Anesthetic in Blood, Mg. per 100 Cc.	Plasma Prothrombin Level, per Cent of Normal, Days After Operation: Before Operation	1	2	3	4	5
			Ether Anesthesia *							
1	19	Hernioplasty	1	67	83	105	103	102	122	100
2	22	Hernioplasty	1	...	88	102	103	89	...	114
3	49	Hysterectomy	1	107	103	103	90	109	120	95
4	62	Bowel resection	3	...	90	...	86	80	89	104
5	30	Drainage retroperitoneal abscess	1¾	96	73	94	82	89	...	86
6	59	Chordotomy	4	83	80	80	61	81	73	82
7	30	Cholecystectomy	2	...	66	80	94	86	...	75
8	43	Cholecystectomy	2	...	110	89	104	71	99	104
9	42	Cholecystectomy	2	...	94	80	112	100	97	132
10	42	Cholecystectomy	2½	...	102	110	114	103	100	...
Average					89	94	95	91	100	99
			Cyclopropane †							
11	21	Pyelostomy	½	...	104	104	98	107	127	...
12	26	Hernioplasty	1	...	100	100	100	115	100	94
13	29	Hernioplasty	1½	15.4	84	105	116	88	99	132
14	30	Hernioplasty	1½	...	93	75	107	94	81	...

* Analytic method for ether in blood: One cc. of oxalated blood was distilled from 20 cc. of saturated picric acid solution into a cooled receiving flask containing standard dichromate solution (2.1288 mg. per liter; 10 cc. = 4.02 mg. of ether). Concentrated sulfuric acid (20 cc.) was added through a reflux tube. The excess dichromate when cool was titrated with a mixture of sulfuric acid, methyl red and ferrous sulfate according to Harger (A Simple Micromethod for the Determination of Alcohol in Biologic Material, J. Lab. & Clin. Med. **20**: 746 [April] 1935).

† Analytic method for cyclopropane in blood: Five cc. of blood plus 5 cc. of water were aerated through an iodine pentoxide train, the iodine released being caught in potassium iodide solution and determined iodometrically (Robbins, B. H.: Cyclopropane: A Method for Quantitating Cyclopropane in Air and Blood: Concentrations of Cyclopropane in the Air and Blood Necessary for Anesthesia, Loss of Reflexes and Respiratory Arrest, Anesth. & Analg. **16**: 93 [March-April] 1937).

In table 2 patients 1 to 6 had conditions independent of disease of the liver or gallbladder, whereas patients 7 to 10 had gallbladder disease without jaundice or biliary fistula. These patients were given ether. There were a few irregularities in results, owing in part at least to unavoidable errors in the determination of the plasma prothrombin level. However, there was no consistent change in any of the cases and the average values show, if anything, a slight rise in prothrombin following operation. In all cases the anesthesia was of at least an hour's duration and in a number it was from two to four hours. In many cases there was a major operative wound and significant tissue trauma. In cases 11 to 14 cyclopropane anesthesia was used and was likewise without effect on the plasma prothrombin levels.

COMMENT

The marked fall in prothrombin which occurs postoperatively in patients with obstructive jaundice and biliary fistulas cannot be explained purely on the basis of these two anesthetic agents. It is evident that other factors play an important role. We have reason to believe that even when the individual suffers from Vitamin K deficiency the anesthetic alone has little or no effect on the plasma prothrombin level. In several dogs with obstructive jaundice or biliary fistula, in which the plasma prothrombin level fell over a period of weeks to from 30 to 70 per cent of normal, simple ether or cyclopropane anesthesia did not produce any further fall in the level.

The factor of trauma in causing the postoperative fall in prothrombin has been stressed by Lord.[5] He found that in healthy dogs massage of the liver for twenty-five minutes produced a fall of from 20 to 30 per cent in the plasma prothrombin level. We have confirmed these results. In view of the lack of depression of the prothrombin level by ether and cyclopropane, it would seem that other factors such as mechanical trauma are more significant in the production of the fall in prothrombin observed in clinical practice.

SUMMARY

Chloroform anesthesia produces a fall in the plasma prothrombin level in man; this observation extends work done previously on animals. Neither ether nor cyclopropane anesthesia produces any such effect in the uncomplicated cases which we have reported. The fall in the plasma prothrombin level which occurs after operation in patients with obstructive jaundice or biliary fistulas is evidently due essentially to factors other than the anesthetic agent itself.

ABSTRACT OF DISCUSSION

DR. HUBERTA M. LIVINGSTONE, Chicago: During the past year Dr. J. Garrott Allen of the University of Chicago and I have studied the effect of ether, ethylene-oxygen, avertin with amylene hydrate, vinethene, and spinal and local anesthesia on the prothrombin concentration in the human being subjected to surgical procedures. These studies were carried out on twenty-two patients who had initial prothrombin deficiency and on sixty-eight patients in whom no prothrombin deficiency was present before operation. We conclude that ordinary anesthetics, blood loss and surgical trauma have little to do with changes in the prothrombin. Of the patients suffering from prothrombin deficiency brought on by either obstructive jaundice or biliary fistula, there was a fall in prothrombin concentration during the postoperative period even though the initial prothrombin deficiency had been corrected by vitamin K or one of its substitutes. This postoperative hypoprothrombinemia was regularly found between the first and seventh postoperative days, and it occurred even when local or spinal anesthetic agents were used. We have observed, however, that a close correlation existed between duration and intensity of preoperative vitamin K therapy and the rapidity with which the postoperative prothrombin deficiency appeared. Since none of the patients of either group received food by mouth before the fourth postoperative day, it is apparent that the prothrombin level must therefore have been maintained by the reserves of potential prothrombin present in the body at the time of the surgical operation. Thus it would seem that the length of time prothrombin concentration could be maintained at a normal level during the postoperative period would depend on the quantity of this reserve present at the time of operation. The sixty-eight patients studied in group 2 were selected because extensive surgical procedures were contemplated. Blood loss determinations carried out on ten of these patients showed a loss ranging from 420 to 1,150 cc., while the anesthetic periods ranged from one hour and twenty minutes to four hours and

5. Lord, J. W., Jr.: Effect of Trauma to the Liver on the Plasma Prothrombin, Surgery **6**: 896 (Dec.) 1939.

forty-five minutes. Of this entire group only one case showed any fall in prothrombin during the postoperative period. In this patient icterus developed on the second postoperative day associated with oliguria and hyperpyrexia, and she died on the fourth postoperative day, apparently of acute hepatic failure, although no autopsy was obtained. The results of our studies would seem to indicate that the most significant cause of the postoperative hypoprothrombinemia in the jaundiced and biliary fistula patients is not anesthesia or operative procedure but rather the failure to establish an adequate prothrombin reserve before operation.

DR. MILTON C. PETERSON, New York: The present widespread enthusiasm and interest with regard to prothrombin levels and vitamin K in the field of surgery makes it essential that the anesthetist be concerned with the prothrombin level as far as its relationship to anesthesia is concerned. In the discussion of this paper the project presented is much larger than might ordinarily be thought of at first observation, since the prothrombin level is dependent on vitamin K, its absorption and the function of the liver, which, as has been pointed out, may be impaired from a number of factors. Still another variable is presented, as the authors have stated, the unavoidable errors in the determination of plasma prothrombin level. In this regard I should like to ask Within what limits must a change occur to be significant with their methods? Also What percentage variation do they consider to be within the normal limits of determination? The apparent discrepancies between the observations of the present authors and those of Dr. Ravdin and his co-workers with regard to liver damage, with and without oxygen enriched mixtures, is at present without significance, as observations were made on histologic and pathologic studies of the liver itself, which may or may not parallel the plasma prothrombin level. This correlation has not been definitely established. Dr. Bourne's studies of liver function by means of dye retention would indicate impairment of liver function for a somewhat longer period of time than is suggested by alterations in the prothrombin level. It was stated that ether and chloroform did not cause a depression in prothrombin level. From the data presented, this would appear true of ether. On the other hand, one of four cases with cyclopropane demonstrated a fall equal to the average fall of the ten chloroform cases presented, although the other three cases demonstrated an insignificant fall or a rise. Because of the complicated variables in this study, conclusions must be guarded until a sufficiently large series is presented to equalize the variance.

DR. MAX H. WEINBERG, Pittsburgh: I should like to ask a question as to the method used in making these tests.

DR. STUART C. CULLEN, Iowa City: In answer to Dr. Peterson, who questions the extent of the limits of variability in prothrombin determinations, it can be said that the limits vary within 20 per cent. That is, a variation in normal individuals from 100 to 80 per cent would be considered within the limits of normal. Dr. Peterson also questions the advisability of using the plasma prothrombin determinations as a test of liver function. Comparative studies with other liver function tests have been done and indicate that function is equally reflected. It is evident that the number of cases followed in which cyclopropane was used is minimal and deserves further investigation, but it is hardly probable that any such conditions as occurred with chloroform will develop. Even though the average fall with chloroform was only 18 per cent, there was a wide variation from 11 to 40 per cent. Dr. Weinberg asked which method for the determination of plasma prothrombin was used. We used the two stage titration method of Warner, Brinkhous and Smith.

Millions of Casts.—The occurrence of casts in the urine of apparently healthy individuals has been shown by Addis. In subjects who were required to abstain from fluid during the day, the night urine (twelve hour period) contained on an average an estimated number of 1,040 casts, with individual values varying from 0 to 4,270. These numbers are insignificant in comparison to the tens and hundreds of thousands, and even millions, of casts excreted in a like period by nephritic patients. —Bodansky, Meyer, and Bodansky, Oscar: Biochemistry of Disease, New York, Macmillan Company, 1940.

THE TREATMENT OF CHRONIC DEAFNESS AND TINNITUS AURIUM WITH PROSTIGMINE

KARL MUSSER HOUSER, M.D.
EDWARD H. CAMPBELL, M.D.
AND
HARRY SCHLUEDERBERG, M.D.
PHILADELPHIA

In 1939 Davis and Rommel[1] reported a series of twenty-four cases of deafness and tinnitus aurium treated with prostigmine methylsulfate hypodermically, along with oral administration of prostigmine bromide. They concluded that patients with acute symptoms usually had restoration of hearing following five or fewer injections, that chronic cases showed encouraging results but responded less rapidly, and that tinnitus aurium was relieved or reduced.

A critical study of this work revealed that accurate hearing tests have not been used in the estimation of hearing loss both before and after treatment. On this account a letter was sent to the company manufacturing the drug stating this fact and asking if the company would cooperate in a comprehensive and well controlled clinical study of the effect of the product on hearing and tinnitus in several Philadelphia clinics. Full cooperation was obtained, and an adequate supply of materials was furnished for the test.

A series of fifty-six cases were studied and treated in the University of Pennsylvania, the Pennsylvania and the Episcopal Hospital clinics. No acute or subacute cases of tympanic and tubal inflammation were included, because such cases properly treated almost always recover without the use of prostigmine.

All cases were first studied with tuning forks and audiometers in the attempt to secure an accurate determination of hearing loss and the type of deafness present. In the table the average decibel and percentage loss is given for only 512, 1,024 and 2,048 frequencies. In testing, however, decibel losses for frequencies from 128 to 8,192 inclusive were obtained. The duration of deafness in the group studied had existed from one to eighteen years. Tinnitus aurium in some degree was present in all but six cases. The age limit was from 13 to 70 years. Most cases were treated and kept under observation for three months, none of the series being treated for less than two months. During the treatment period 1 cc. of prostigmine methylsulfate, 1:2,000 dilution, was given hypodermically every third day. In addition 15 mg. of prostigmine bromide was given after meals during the first six weeks of treatment. Audiograms were taken every two or three weeks while treatment was in progress. Local treatment if indicated, such as inflation and massage, or attention to nose, throat or sinuses, was not interrupted during the treatment period.

It is well recognized by otologists that audiograms taken on separate occasions will not always give identical readings in either the normal or the hard of hearing patient. Usually one allows for a $+7$ or -7 decibel variation. This fact should be understood lest one draw inaccurate conclusions from a decibel change of 15 or less. In our series seven patients, 12.5 per

1. Davis, T. Carroll, and Rommel, John C.: Treatment of Deafness and Contiguous Nervous Disorders with Prostigmine, Arch. Otol. 29: 751-758 (May) 1939.

cent, showed improvement in the right ear of 10 decibels or more. On the left side, 7.1 per cent were improved in this degree. Only two patients improved more than 15 decibels. Cases showing a + 10 decibel or more gain can be identified in the table by referring to cases 4, 7, 9, 16, 24, 29 and 30. Of these patients only three, 16, 19 and 24, had enough improvement to be appreciable to the patient. One of these, patient 19, was syphilitic, and no improvement occurred until antisyphilitic therapy was given. The final result then was two patients, 3.5 per cent, who felt that any practical improvement in hearing had occurred.

Seven of the treated patients felt that they experienced some relief of tinnitus, three were doubtful and forty-six were definitely not improved. No patients lost their tinnitus. No untoward symptoms, except occasional slight nausea and minor vertigo, were reported by any patient.

CONCLUSIONS

1. In a series of fifty-six carefully tested and controlled cases of chronic deafness, prostigmine treatment failed to exert a definite beneficial effect.

2. It is doubtful that any real effect is produced on tinnitus aurium. Seven patients felt that some improvement had taken place. None lost their tinnitus completely.

3. Our studies lead us to believe that the treatment of deafness and tinnitus aurium with prostigmine is of but little if any value.

2010 Spruce Street.

Composite Table of All Patients Treated with Prostigmine.

Decibel estimations refer to averages for 512, 1,024 and 2,048 frequencies

			Right Ear						Left Ear				Net Change			
			Tinnitus		Decibel Loss		Per Cent Loss		Decibel Loss		Per Cent Loss		Right		Left	
Case	Age	Type of Deafness	Before	After	Before	After	Before	After	Before	After	Before	After	Decibels + or −	Per Cent + or −	Decibels + or −	Per Cent + or −
1	40	Mixed	+	+	43	45	35	36	63	60	51	48	− 2	− 1	3	3
2	20	Conductive	+	+	43	43	35	35	50	53	40	43	0	0	− 3	− 3
3	38	Conductive	+	+	50	55	40	44	53	65	43	52	− 5	− 4	− 8	− 8
4	35	Conductive	+	+	31	18	25	15	54	41	44	33	13	10	13	11
5	29	Perceptive	+	+	86	91	69	73	66	83	53	67	− 5	− 4	−17	−14
6	49	Perceptive	+	+	36	33	29	27	31	31	25	25	3	2	0	0
7	28	Conductive	+	+	63	53	51	43	58	45	47	36	10	8	13	11
8	46	Perceptive	+	+	100+	100+	100	100	51	48	41	39	0	0	3	2
9	58	Perceptive	+	+	63	48	51	39	54	43	44	35	15	12	11	9
10	65	Mixed	+	±	70	70	56	56	41	48	33	39	0	0	− 7	− 6
11	67	Perceptive	0	0	52	52	42	42	61	52	49	42	0	0	9	7
12	69	Perceptive	±	±	66	65	53	52	35	32	28	26	1	1	3	2
13	62	Perceptive	+	+	20	13	16	11	76	71	61	57	7	5	5	4
14	22	Mixed	+	±	71	66	57	53	75	73	60	59	5	4	2	1
15	55	Mixed	+	+	98	95	79	77	95	94	77	76	3	2	1	1
16	22	Perceptive	+	±	50	43	40	35	43	38	35	31	7	5	5	4
17	41	Conductive	+	+	28	28	23	23	32	35	26	28	0	0	− 3	− 2
18	16	Conductive	+	+	83	83	67	67	70	70	56	56	0	0	0	0
19	73	Mixed	+	±	67	63	54	51	88	57	71	46	4	3	31	25
20	45	Mixed	+	?	41	48	33	39	46	43	37	35	7	6	3	2
21	38	Conductive	0	0	32	35	26	28	41	36	33	29	− 3	− 2	5	4
22	71	Perceptive	+	+	18	12	15	10	48	41	39	33	6	5	7	6
23	63	Perceptive	+	+	41	36	33	29	38	36	31	29	5	4	2	2
24	42	Perceptive	+	±	28	12	23	10	13	11	11	9	14	13	2	2
25	25	Mixed	+	+	41	36	33	39	52	46	42	37	5	4	6	5
26	26	Perceptive	+	+	0	0	0	0	8	3	7	3	0	0	5	4
27	30	Conductive	+	±±	14	10	12	8	6	6	5	5	4	4	0	0
28	70	Perceptive	+	±	51	51	46	46	73	65	59	52	0	0	8	7
29	72	Perceptive	+	+	53	39	43	39	50	48	40	39	14	12	2	1
30	65	Mixed	+	+	45	32	36	26	53	46	43	37	13	10	9	6
31	50	Perceptive	+	+	21	51	17	46	0	0	0	0	−30	−29	0	0
32	52	Perceptive	+	+	50	50	40	40	43	43	35	35	0	0	0	0
33	68	Perceptive	+	+	50	50	40	40	50	50	40	40	0	0	0	0
34	56	Perceptive	+	+	73	81	59	65	38	38	31	26	− 8	− 6	6	5
35	42	Conductive	0	0	23	23	19	19	21	28	17	23	0	0	− 7	− 6
36	40	Conductive	0	0	90	87	72	70	98	90	79	72	3	2	8	7
37	38	Perceptive	+	+	67	59	54	47	40	41	32	33	8	7	− 1	− 1
38	13	Conductive	0	0	14	15	12	13	18	13	15	11	− 1	− 1	5	4
39	54	Perceptive	+	+	20	22	16	18	28	21	23	17	− 2	− 2	7	6
40	43	Perceptive	+	+	45	48	36	39	58	53	47	43	− 3	− 3	5	4
41	21	Conductive	+	+	0	0	0	0	15	14	13	12	0	0	1	1
42	77	Mixed	+	+	46	41	37	33	46	38	37	31	5	4	8	6
43	16	Perceptive	+	+	28	21	23	17	45	40	36	32	7	6	5	4
44	66	Conductive	+	+	41	43	33	35	22	23	18	19	2	2	− 1	− 1
45	40	Conductive	+	+	73	73	59	59	81	82	65	66	0	0	− 1	− 1
46	47	Perceptive	+	?	38	41	31	33	43	41	35	33	− 3	− 2	2	2
47	23	Perceptive	+	+	77	82	62	66	88	82	71	66	− 5	− 4	6	5
48	53	Perceptive	+	+	65	65	52	52	54	65	44	52	0	0	− 9	− 8
49	32	Perceptive	+	+	46	46	37	37	81	81	65	65	0	0	0	0
50	48	Perceptive	+	+	71	71	57	57	65	65	52	52	0	0	0	0
51	38	Perceptive	+	+	15	23	13	19	52	66	42	53	− 8	− 6	−14	−11
52	49	Conductive	+	+	20	21	16	17	13	14	11	12	− 1	− 1	− 1	− 1
53	42	Conductive	+	+	88	80	71	64	80	85	64	68	8	7	− 5	− 4
54	27	Conductive	+	+	35	40	28	32	43	35	35	28	− 5	− 4	8	7
55	70	Perceptive	+	+	38	33	31	26	40	40	32	32	5	4	0	0
56	54	Conductive	0	0	35	30	28	24	35	35	31	31	5	4	0	0

SUMMARIES

Tinnitus Aurium	
Probable improvement	7.
Doubtful improvement	3.
Not improved	46.

Changes observed in hearing status	Right	Left
No change of hearing status	16.	10.
Hearing worse than before	14.	13.
Improvement less than ten decibels	19.	29.
Improvement more than ten decibels	7.	4.

FETAL AND NEONATAL DEATHS

A STATISTICAL ANALYSIS OF 2,000 AUTOPSIES

EDITH L. POTTER, M.D.
CHICAGO

In the Department of Obstetrics and Gynecology of the University of Chicago from Oct. 1, 1934, until April 1, 1940, we have had the opportunity of examining at autopsy more than 2,500 fetuses and infants of varying gestational age and extra-uterine age up to 1 year. This has in part been made possible by the cooperation of Dr. Herman Bundesen, president of the Chicago Board of Health.

The present report is based on 2,000 autopsies which comprise the entire group with the exclusion of the fetuses classed as abortions,[1] the infants over 1 month of age and those in which adequate maternal and infant histories were unavailable.

TABLE 1.—*Gestational Age in Relation to Time of Death*

	Previable	Premature	Term	Total
Antepartum death	160 (8.0%)	265 (13.25%)	227 (11.35%)	652 (32.6%)
Intrapartum death	95 (4.75%)	139 (6.95%)	319 (15.95%)	553 (27.65%)
Neonatal death....	155 (7.75%)	348 (15.4%)	292 (14.60%)	795 (39.75%)
Total.....	410 (20.5%)	753 (37.6%)	838 (41.9%)	2000 (100%)

Six hundred and eight of the fetuses and infants were born and died at the Chicago Lying-in Hospital, 895 were sent to us for autopsy, and 497 were examined at autopsy elsewhere by Dr. Aaron Gunther for the Chicago Board of Health and tissues sent to us for microscopic examination. In each case a complete autopsy including examination of the head was performed and tissues were subjected to microscopic study. In all macerated fetuses and in others in which there was any suspicion of syphilis, Levaditi stains for spirochetes were included. Bacterial cultures and other procedures were used when indicated. The placentas were available for study in almost half of the cases. I made all microscopic examination of the tissues. The method of autopsy and the criteria on which the diagnoses were based have been reported in detail in other publications and will not be reviewed here.[2]

In such a series the sequence of events which has led to the death of any infant cannot be unfolded in detail, and often from the multiplicity of conditions which have played a part in the disastrous outcome only a single one, which to the investgator seems most important, can be recorded. The five factors which must be considered in each case are the time of death in relation to birth, gestational age at birth, method of delivery, complications of pregnancy and labor, and the pathologic lesions present in the body of the fetus or infant. In order to be as lucid as possible, I will discuss these various conditions individually.

From the Department of Obstetrics and Gynecology, the University of Chicago and the Chicago Lying-in Hospital.

Read before the joint meeting of the Section on Obstetrics and Gynecology and the Section on Pediatrics at the Ninety-First Annual Session of the American Medical Association, New York, June 14, 1940.

1. If the fetus fulfilled two of the three following criteria, it was classed as an abortion: length less than 35 cm., weight less than 400 Gm., gestational age less than twenty-two weeks. The arbitrary division is used since the Illinois law requires the reporting of all stillbirths in which the fetus is advanced to the fifth month of gestation.

2. Potter, Edith L.: Postmortem Examination of Stillborn and Newly Born Infants, Arch. Path. **25**: 607 (May) 1938. Potter, Edith L., and Adair, F. L.: Fetal and Neonatal Deaths: An Analysis of 773 Such Deaths Occurring with 17,738 Deliveries at the Chicago Lying-in Hospital, J. A. M. A. **112**: 1549 (April 22) 1939; Fetal and Neonatal Deaths, Chicago, University of Chicago Press, 1940.

AGE AT DEATH

Of the entire series 1,205 (60 per cent) fetuses were stillborn and 795 (40 per cent) were alive at birth. Six hundred and fifty-two (32 per cent) of the fetal deaths occurred prior to the onset of labor and 553 (28 per cent) took place during labor or delivery. Of the infants that were born alive 193 (24 per cent) lived less than one hour, 360 (45 per cent) more than one and less than twenty-four hours, and ninety-three (12 per cent) from twenty-four to forty-eight hours. One hundred and thirteen (14 per cent) died between the end of the second day and the end of the second week, and thirty-six (4.5 per cent) succumbed during the third and fourth week. One hundred and sixty-five infants who died between the end of the first month and the end of the first year were also examined during the course of this study but are not included in this discussion. It is interesting to note that the number of infants dying during the first forty-eight hours of life is identical with the number of antepartum deaths.

Seventy per cent of the 795 deaths occurred under forty-eight hours. This strikingly illustrates the fact, stressed by many investigators, that the first two days are the most crucial in the infant's entire existence. The majority of deaths during this time are the result of harmful conditions affecting the fetus during labor or delivery, and, if neonatal mortality is to be appreciably lowered, effort must be directed toward removing injurious conditions operating before the infant is born.

In the entire series 410 (20.5 per cent) fetuses and infants were previable,[3] 753 (37.6 per cent) were viable premature [4] and 838 (41.9 per cent) were at term (table 1). The stage to which pregnancy had advanced when death or delivery occurred is much the same in the antepartum, intrapartum and neonatal groups except

TABLE 2.—*Anatomic Manifestations in Relation to Time of Birth*

	No Abnormalities	Intracranial Hemorrhage	Asphyxia	Malformations	Infections	Syphilis	Erythroblastosis	Miscellaneous	Total, %
Antepartum									
Previable..	79.7	....	6.4	10.1	2.0	1.2	...	0.6	100
Premature.	64.9	....	18.9	7.6	0.7	4.2	3.7	...	100
Term.....	68.0	....	20.2	3.0	2.4	1.8	4.4	0.4	100
Intrapartum									
Previable..	64.2	13.7	12.6	5.2	3.2	...	1.0	...	100
Premature.	28.1	16.5	39.6	13.0	0.7	1.4	...	0.7	100
Term.....	19.4	28.0	36.6	9.1	6.3	0.3	1.6	...	100
Neonatal deaths									
Previable..	71.8	9.4	5.8	2.0	11.0	...	...	...	100
Premature.	34.8	15.2	16.7	13.2	14.0	0.8	0.8	3.4	100
Term.....	13.0	27.5	8.4	22.0	19.7	0.7	5.4	3.3	100
Total.....	43.5	14.3	19.4	10.3	7.9	1.2	2.2	1.2	100

that during the intrapartum period the incidence among previable and premature infants is disproportionately low, suggesting that the factor of immaturity may be more of a hazard in establishing an extra-uterine existence than it is during the passage through the birth canal.

3. Two of the three following criteria: weight from 400 to 999 Gm., length from 22.1 to 35 cm., menstrual age 22 through 28 weeks.

4. Two of the three following criteria: weight from 1,000 to 2,499 Gm., length from 35.1 to 47 cm., menstrual age 29 through 47 weeks. Infants and fetuses falling in this group are hereafter referred to only as "premature."

ANATOMIC ABNORMALITIES FOUND AT AUTOPSY (TABLE 2)

No abnormalities[5] could be demonstrated in the bodies of 43.5 per cent (870) of the 2,000 fetuses and infants. This ranged from 80 per cent in the previable fetuses dying before the onset of labor to only 13 per cent in the mature infants dying after birth. In general, irrespective of the time of death, 70 per cent of the previable group failed to show pathologic changes, and even in those in whom abnormal conditions were found the lesions can hardly be considered the cause of death, since the infants would have died immediately after birth even in their absence. The actual causes of death must be sought in the conditions which incited labor prematurely. Also about 70 per cent of all fetuses who died before the onset of labor failed to show demonstrable changes other than maceration. In the term infants and fetuses who died during labor or after birth, pathologic lesions were absent in only about 15 per cent.

In the total autopsies, evidence of asphyxia[6] was the pathologic state most frequently found and was present in 19.4 per cent (378). It was more common when death occurred during the intrapartum period (40 per cent in premature and term fetuses) than at any other time and was found in only 6 per cent of the infants born alive. The majority (80 per cent) of deaths in live born infants from this cause occurred in the group living less than twenty-four hours and in many of these respiration was never established. The complications which were present in association with this condition were much the same in the fetuses who died after birth and those who died during labor. They consisted largely of maternal hemorrhage from placenta praevia or premature placental detachment or from entanglements, prolapse or other abnormalities of the umbilical cord.

Traumatic hemorrhage was found in 14.3 per cent (274) of the entire group and was second in frequency to asphyxia. Its incidence in term infants dying either during labor or after birth was almost twice as great as in the premature and either two or three times greater than in the previable fetuses dying in the same periods. This indicates that of 100 mature infants and 100 premature infants who die during labor the likelihood of the mature infant succumbing as a result of mechanical injury and hemorrhage is twice as great as of the premature succumbing from the same cause. It must be kept in mind, however, that in general the total mortality rate for premature infants is from fifteen to twenty times as great as for those at term. In a previous study of the fetal and infant deaths occurring at the Chicago Lying-in Hospital we have shown that of every 1,000 infants delivered there were about ten mature and ten premature who died. Two of the mature and one of the premature showed traumatic hemorrhages.

The total injuries in the present series consisted of 244 instances of hemorrhage within the cranial cavity, twenty-eight lacerations of abdominal organs and two fractures of the spinal column. In ninety intracranial hemorrhages the exact locus was unstated, in 129 it was associated with rupture of the vein of Galen or the dural sinuses, in twenty-four it was intraventricular (this was practically the only variety found in previable fetuses) and in eleven it was diffuse over the cerebral hemispheres. In twenty-four of the visceral injuries the organ involved was the liver; in the remaining four the hemorrhage was in the adrenals. In two cases the spinal cord was completely severed.

Malformations incompatible with life were found in 10.3 per cent (209) of the entire group. They were much more commonly a cause of neonatal death (14.4 per cent) than of stillbirth (antepartum death 6.7 per cent, intrapartum death 9.4 per cent) and were most often found in those infants who were born alive at term (22.0 per cent). Almost half (44.7 per cent) of the malformations consisted of hydrocephalus or anencephalus and the remainder were divided between cardiac 10.4 per cent, skeletal 7.6 per cent, gastro-intestinal 4.2 per cent, miscellaneous and multiple anomalies 5.2 per cent. In addition to these major malformations there were thirty-eight minor anomalies such as clubfoot, harelip, extra digits and others in which the abnormality was not considered a cause of death.

Syphilis was definitely demonstrated in the bodies of only twenty-six (1.2 per cent) fetuses and infants. In an additional forty-seven there was a history of maternal syphilis or the Wassermann reaction was positive sometime during pregnancy. Many of these syphilitic women had been under treatment for varying lengths of time and in many of the offspring other definite abnormalities were present, so that although in some of these instances syphilis may have been a contributing factor, it was not the principal cause of death.

Infections other than syphilis were present in 158 (7.9 per cent) instances as the major cause of death. Almost all of these were pneumonia and occurred most commonly among the infants who died after birth (124, or 15.6 per cent), although evidence of intra-uterine pneumonia was present in 2.5 per cent (ten) of the fetuses dying before the onset of labor and in 4.4 per cent (twenty-four) of those dying during labor. Pneumonia occurring in fetuses who die prior to the onset

TABLE 3.—*Anatomic Manifestations in Relation to Age at Death in 960 Live Born Infants*

Age by Cause	Less Than 1 Hour		1-24 Hr.		24-48 Hr.		2-14 Days		14-30 Days		Total Birth to 30 Days		30 Days to 1 Year		Grand Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Prematurity	79	40.9	184	51.1	23	24.7	16	14.2	3	8.3	305	38.4	6	3.6	313	32.2
Asphyxia	12	6.2	34	9.4	8	8.6	3	2.7	1	2.8	58	7.3	3	1.8	63	6.5
Birth trauma	35	18.1	52	14.4	24	25.8	16	14.2	1	2.8	128	16.1	2	1.2	132	13.6
Malformations	40	20.7	28	7.8	11	11.8	28	24.8	7	19.4	114	14.3	23	13.9	139	14.3
Pneumonia	6	0.3	27	7.5	17	18.3	36	31.9	18	50.0	104	13.1	104	63.0	208	21.4
Erythroblastosis	5	2.6	7	1.9	2	2.2	1	0.8	..	....	15	1.9	..	....	16	1.6
Syphilis	1	0.5	3	0.8	1	1.0	..	....	..	....	5	6.3	4	2.4	9	0.9
Miscellaneous	3	1.5	10	2.8	3	3.2	3	2.7	..	....	19	2.4	..	....	20	2.0
Maternal toxemia without other cause	5	2.6	1	0.2	..	....	1	0.9	..	....	7	0.9	3	1.8	10	1.0
Unknown, term	7	3.6	14	3.9	4	4.3	9	8.0	6	16.7	40	5.0	20	12.1	60	6.3
Total		100%		100%		100%		100%		100%		100%		100%		100%

5. Maceration was not considered a pathologic lesion.

6. In this paper "asphyxia" is used to mean a condition in the fetus resulting from oxygen deprivation caused by obstruction to the umbilical circulation.

of or during labor and in infants who succumb within a few hours or days after delivery usually has a common etiologic background. Bacteria are admitted entrance to the amniotic fluid through early rupture of membranes, prolonged labor or some other complication. Aspiration of amniotic fluid introduces organisms into the lungs of the fetuses and an inflammatory reaction ensues. The possibility of pneumonia is a definite hazard to the fetus during a long and complicated labor, particularly when the membranes have ruptured early. In the majority of deaths from pneumonia such conditions were found.

The incidence of pneumonia as a cause of death increases with each day of extra-uterine life. It accounts for 6 per cent of the deaths on the first day, 18 per cent on the second, 32 per cent from the end of the second day to the end of the second week and 50 per cent during the third and fourth weeks. Among the 165 infants not included in this study who died between the end of the first month and the end of the first year, 63 per cent died of infections, largely pneumonia

TABLE 4.—*Anatomic Manifestations in Relation to Method of Delivery in 895 Selected Infants and Fetuses*

	Natural Cephalic		Low Forceps		Mid Forceps		Breech		Version and Extraction		Cesarean Section	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Hemorrhage associated with trauma	80	18.4	34	34.0	39	76.5	56	41.5	23	42.7	8	11.8
Hemorrhage associated with asphyxia	128	28.9	25	25.0	3	5.9	38	28.1	13	24.1	22	32.3
Infections	85	19.2	13	13.0	5	9.5	6	4.4	2	3.7	11	16.2
Other	11	2.5	1	1.0	..	....	..	....	..	....	11	16.2
No abnormalities, premature	93	20.5	9	9.0	1	2.0	27	20.1	10	18.5	10	14.7
No abnormalities, term	46	10.8	18	18.0	3	5.8	8	5.8	6	11.1	6	8.8
Total	443	100.0	100	100.0	51	100.0	135	100.0	54	100.0	68	100.0

All fetuses dying in the antepartum period or who were previable, malformed or suffering from syphilis and erythroblastosis have been eliminated.

(table 3). This does not include those cases in which the pneumonia was secondary to a communicable or other known disease.

In addition to the 7.9 per cent of fetuses and infants in which pneumonia was considered the primary cause of death, it was found in 3.7 per cent (seventy-four) as a complicating factor in combination with some other fundamental lesion. Intracranial hemorrhage (forty-four cases) was the condition with which it was most frequently associated.

METHOD OF DELIVERY

The pole of the fetus which presents in the maternal pelvis and the methods by which delivery is accomplished either as a result of natural forces or because of artificial termination necessitated by various complications bear an important relationship to the pathologic states found in the offspring. Deaths in which manner of delivery could have played no part include those which occurred before the onset of labor and those in which the fetus was previable, fatally malformed or suffering from erythroblastosis or extensive syphilis. If these, plus the fetuses on whom destructive operations were performed, are eliminated 787 cases remain (table 4). In caudal presentations, and in all operative terminations of labor except cesarean section, hemorrhage due to trauma was the most frequent cause of death and was found more than twice as often as in natural cephalic delivery. In caudal deliveries the incidence was more than twice as great as in natural cephalic deliveries. This difference is not due to the fact that the number of the premature infants delivered by

TABLE 5.—*Maternal Complications Present in 1,033 Women in Association with 2,000 Fetal and Neonatal Deaths*

	Total Complications	Complications Considered of Greatest Importance	Complications Considered the Cause of Death
Toxemia	253	215	97
Abruptio	151	151	126
Placenta praevia	101	99	70
Minor hemorrhage and cord entanglements	133	117	58
Prolapsed cord	61	48	33
Uterine inertia, contracted pelvis, and so on	150	116	103
Syphilis	72	51	26
Diseases unrelated to pregnancy	92	61	30
Miscellaneous	180	149	84
Total	1,144	1,033	597

breech is proportionately greater than the natural cephalic deliveries. If mature infants alone are considered, the proportion of infants dying in the intrapartum and neonatal periods who show intracranial injury is 43.7 per cent in the caudal deliveries and 19.2 per cent in cephalic deliveries. Caudal presentation presents a distinctly greater hazard of birth trauma to the fetus than does a cephalic presentation. The incidence of infections in the fetuses and infants delivered by breech is only a little more than one fourth that found in those who are delivered naturally in a cephalic presentation. No explanation is known.

Complications of pregnancy or labor were present in 1,033 women (51.6 per cent, table 5). In 111, more than one condition was found. Toxemia occurred as the most common complication and was present in 12.6 per cent (253) of the mothers included in this study (these consisted of twenty-one cases of eclampsia, thirty cases in which hypertension alone was present, seven cases of hyperemesis gravidarum and 194 in which albuminuria, hypertension and edema were pres-

TABLE 6.—*Final Diagnosis of Cause of Death of 2,000 Fetuses and Infants Based on Clinical and Anatomic Evidence*

	Number	Per Cent
Prematurity	416	20.7
Asphyxia	324	16.1
Birth trauma	255	12.7
Malformations	209	10.4
Pneumonia	132	6.5
Erythroblastosis	39	1.8
Syphilis	26	1.2
Miscellaneous	22	1.1
Maternal toxemia without other cause	97	4.7
Unknown		
1. Premature	231	12.5
2. Term	249	12.3
Total	2,000	100.0

1. Antepartum deaths before term.
2. Includes 145 antepartum deaths at term.

ent). This is almost twice the incidence of toxemia (7 per cent) found by Dieckmann in the total mothers delivered at the Chicago Lying-in Hospital. It was considered the probable cause of death in only 4.9 per cent, or only when no demonstrable cause could be found in the bodies of the fetuses or infants. I have hesi-

tated except on rare occasions to say that toxemia was the specific cause of death, since it produces no definite pathologic changes and the infants of toxemic mothers may die of the same conditions which affect those born of nontoxemic mothers. It is perhaps wiser in such cases to say that the infants show no abnormalities but that there was an associated maternal toxemia.

Abruptio placentae was second in frequency with an incidence of 7.6 per cent (150). The placental and cord disturbances, which so frequently lead to fatal asphyxia in the fetus, when added together were found in 22.3 per cent of the cases and in the final analysis were considered the probable immediate cause of death in 14.4 per cent. Abnormalities of labor due to uterine inertia, contracted pelvis and so on occurred in 7.5 per cent and were considered in 5.2 per cent to have caused death by the production of asphyxia or intracranial injury.

Maternal complications accounted for 30 per cent, or almost one third of the entire group of deaths; in 48 per cent no known complications of any kind were present; in the remaining 22 per cent some condition found at autopsy was considered of more significance than the maternal complications.

for 20.7 per cent (416) of all deaths. Asphyxia 16.1 per cent, birth trauma 12.7 per cent, and malformations 10.4 per cent make up the next three leading causes. Pneumonia 6.5 per cent, infants otherwise normal but born of mothers with toxemia 4.7 per cent, erythroblastosis 1.8 per cent, syphilis 1.2 per cent and miscellaneous 1.1 per cent compose the remainder. The higher incidence of pneumonia in this series than that found in the majority of reports is probably due to the fact that secretions of all lungs were examined microscopically. It is almost impossible in the newborn to make a gross diagnosis of this condition, and without microscopic examination these infants are usually considered to be suffering from atelectasis.

This clinicopathologic classification of fetal and infant deaths was used as a basis of an attempt to discover what role maternal age, parity, color and the sex of the infant might play in the fatal outcome.

MATERNAL AGE

The maternal age was stated in 1,881 cases (table 7). In comparison with the figures showing distribution of live births in relation to maternal age compiled by the Bureau of the Census, the present series shows

TABLE 7.—*Maternal Age in Relation to Cause of Death*

Maternal Age	10-19		20-24		25-29		30-34		35-39		40+		Unstated		Total, %	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Prematurity	59	14.2	100	24.0	103	24.8	71	17.1	49	14.7	8	1.9	26	6.3	416	100
Asphyxia	32	9.8	80	14.6	72	22.2	67	20.6	35	10.8	27	8.3	11	3.3	324	100
Birth trauma	21	8.2	56	21.9	61	23.9	45	17.6	26	10.1	11	4.3	35	13.7	255	100
Malformations	16	7.6	56	26.7	50	23.9	37	17.7	22	10.5	5	2.3	23	11.0	209	100
Infections	17	12.8	36	27.2	29	21.9	23	17.4	15	11.3	6	4.5	6	4.5	132	100
Erythroblastosis	..	....	9	23.0	7	17.9	10	35.8	9	23.0	4	10.2	..	....	39	100
Syphilis	6	23.1	6	23.1	8	40.0	4	20.0	1	3.8	..	....	1	3.8	26	100
Miscellaneous	2	9.0	5	22.7	7	31.8	3	13.6	2	9.0	2	9.0	1	4.5	22	100
Maternal toxemia without other cause	1	1.0	14	14.4	29	29.8	22	22.6	17	17.5	12	12.3	2	2.0	97	100
*No known factors (premature)	22	9.4	57	24.4	64	27.4	45	19.4	27	11.4	13	5.5	6	2.5	234	100
†No known factors (term)	16	6.5	54	21.9	61	24.7	56	22.7	38	15.4	13	5.2	8	3.2	246	100
Total	192	9.6	473	23.4	491	24.3	383	19.0	241	12.0	101	5.0	110	5.8	2,000	100

* Antepartum deaths before term.

† Includes antepartum deaths in succeeding order: 6, 25, 35, 37, 24, 12, 3.

Eleven maternal deaths occurred in this series during pregnancy or in the immediate postpartum period. Two women died undelivered, one from hemorrhage as a result of rupture of the uterus, the other of eclampsia. Of the other nine, four deaths were due to hemorrhage (two associated with placenta praevia and two with premature detachment) and five were from eclampsia.

FINAL ANALYSIS

When all the information that could be obtained was at hand, each case was reviewed and a final conclusion reached as to the most probable cause of death (table 6).

In approximately 25 per cent no known factors were present in the maternal history which might reasonably have been expected to contribute to the fatal outcome, and no abnormalities were found in the bodies of the fetuses. Three fourths (376) of these died before the onset of labor. This group of fetuses in nontoxemic women who die without apparent cause present one of the most baffling problems in the study of fetal deaths and one which is in need of further investigation. The other one fourth (104) of the unknown group were at term and died during labor or after birth. Thus, only 5.2 per cent of the series died during labor or after birth of entirely unknown causes.

Among those in whom a cause of death was postulated, prematurity without demonstrable pathologic lesions made up the greatest number and accounted a lower incidence of deaths in the mothers under 30 and a higher incidence over 30 than would be expected if the deaths were distributed evenly at all ages in proportion to births. The mother over 30 has proportionately a greater chance of having a dead baby than the mother under 30.

Most of the causes of death show little variation in incidence in the various maternal age periods, but several interesting factors may be noted. Although the incidence of antepartum deaths before fetal maturity averages about the same at all ages, prematurity without demonstrable pathologic conditions as a cause of death during or after birth is proportionately much more common in younger than in older women. There is a steady decline from 30.8 per cent in women less than 20 years of age to 7.9 per cent in the age group over 40. It would appear that although a woman under 30 is in general less likely to have a dead baby than is one over 30, if death does occur the infant is more apt to die of prematurity and is less apt to show definite pathologic lesions than is that of the older woman. The lower incidence of deaths from prematurity among older women cannot be definitely explained. Although some data have been published which seem to indicate a slightly longer period of gestation in multiparous than in primiparous women, in the present study the incidence of prematurity among primiparous and multip-

arous women is the same, so that this does not seem to be the cause. It may be that the improved social conditions which often come with increase in age or better antepartum care resulting for increased desire for motherhood may play a part in preventing premature labor.

TABLE 8.—*Parity in Relation to Cause of Death*

	Primigravida		Multigravida	
	No.	%	No.	%
Prematurity	142	21.0	248	20.5
Asphyxia	98	14.5	212	17.6
Birth trauma	116	16.3	113	9.4
Malformations	69	10.2	118	9.8
Infections	51	7.5	76	6.3
Erythroblastosis	....	....	38	3.2
Syphilis	10	1.5	14	1.2
Miscellaneous	6	0.9	15	1.2
Maternal toxemia without other cause	36	5.3	55	4.6
No known factors, premature	75	11.2	156	12.9
No known factors, term	79	11.7	160	13.3
Total	676	100.0	1,205	100.0

The incidence of maternal toxemia in the absence of demonstrable pathologic changes in the infants and fetuses shows a fairly steady increase from 0.5 per cent in the age group under 20 years to 11.9 per cent in the group over 40 years.

Erythroblastosis shows a gradual but steady increase from 0 per cent under 20 years of age to 4 per cent over 40 years.

The incidence of birth trauma, malformations, asphyxia and infections shows little variation in incidence in the various age groups except that asphyxia is somewhat more and malformations are somewhat less frequent than the average in the age period over 40 years.

PARITY

The number of previous pregnancies which the mother had undergone was stated in 1,881 of the 2,000 cases. Because of the inadequacy of specific information concerning abortions, no attempt was made to differentiate parity and gravidity. There were 676 who had had no previous pregnancies, 1,205 who had had one or more. Of these 389 had had one, 241 had had two, 171 three, 112 four, 79 five and the remainder six or more previous pregnancies. There is no appreciable difference between the incidence of any condition as a cause of death in the primigravidas and multigravidas with the exception that erythroblastosis does not appear in the first group and accounts for 3.2 per cent (thirty-eight cases) in the second group; and the incidence of birth trauma is almost twice as great in the primigravidas as in multigravidas.

TABLE 9.—*Cause of Death in Relation to Color*

	White		Black	
	No.	%	No.	%
Prematurity	349	20.1	67	24.7
Asphyxia	287	16.5	37	13.7
Birth trauma	229	13.5	26	9.6
Malformations	195	11.3	14	5.1
Pneumonia, and so on	107	6.2	25	9.3
Erythroblastosis	37	2.1	2	0.7
Syphilis	15	0.8	11	4.0
Miscellaneous	21	1.2	1	0.3
Maternal toxemia without other cause	86	5.0	11	4.1
No known factors, premature*	190	11.0	41	15.1
No known factors, term†	213	12.3	36	13.3
Total	1,728	100.0	272	100.0

* Antepartum deaths before term.

† Includes 129 white and sixteen black fetuses dying in antepartum period.

COLOR

The color was stated in the total 2,000 fetuses and infants; 1,728 (86.4 per cent) were white. Of the remainder 267 (13.6 per cent) were Negroes, two were Chinese and three were Mexican. The most marked differences in incidence of the various conditions in the two groups is in syphilis, which is five times as frequent among the Negroes as among white persons and in malformations, which are twice as common in white persons as in Negroes. Prematurity and infections are slightly but not appreciably higher among Negroes, while asphyxia and birth trauma occur with slightly less frequency.

SEX

Sex was stated in 1,910 instances; 54.5 per cent (1,040) were male, 45.5 per cent (870) female. The sex ratio for total births is 1,000 females to 1,004 males. In this study the ratio is 1,000 females to 1,200 males. No marked variations in cause of death were found in the two groups. Malformations show the greatest difference with an incidence of 8.4 per cent among males and 12.9 per cent among females, and birth trauma ranks next with an incidence of 14.4 per cent among males and 11.0 per cent among females. When the incidence of the various causes of death is calculated in individual groups in the antepartum, intrapartum and neonatal period, no further variations in relation to differences between the sexes are brought out.

TABLE 10.—*Cause of Death in Relation to Sex*

	Male		Female	
	No.	%	No.	%
Prematurity	227	21.8	175	20.1
Asphyxia	166	16.0	151	17.4
Birth trauma	150	14.4	96	11.0
Malformations	87	8.4	112	12.9
Pneumonia	76	7.3	51	5.9
Syphilis	11	1.1	14	1.6
Erythroblastosis	23	2.2	13	1.5
Miscellaneous	13	1.2	9	1.0
Maternal toxemia without other cause	45	4.3	47	5.4
Unknown				
Premature*	110	10.6	106	12.2
Term	132	12.7	96	11.0
Total	1,040	100.0	870	100.0

* Antepartum deaths.

SUMMARY

Fetuses dying before the onset of labor comprise almost one third of the total cases studied in this series. In approximately one half of these there were maternal conditions which may have caused death, and in at least one third there were neither maternal complications nor pathologic changes in the fetus. Toxemia and placental detachment were the most common two complications.

Deaths in the intrapartum period are usually due to some disturbance of the normal mechanism of labor and delivery. Intracranial hemorrhage is considerably more common in association with caudal and all artificial deliveries than in natural cephalic terminations of labor. The incidence of trauma among the premature group is less than that found in the mature group. Complications arising during pregnancy or labor are usually the reason for artificial terminations.

Deaths in the neonatal period are most frequently due to prematurity, secondly to birth trauma, thirdly to

malformations. Pneumonia is an extremely important condition and after the end of the first forty-eight hours is the leading cause of death.

CONCLUSIONS

It is extremely difficult to say in general which deaths are preventable and which are not. Those from malformations in our present state of knowledge are entirely nonpreventable, but all others theoretically are at least basically preventable. Although it is practically impossible to keep a previable infant alive, and this is a nonpreventable death after delivery has once occurred, modification of the status of the maternal organism before or during pregnancy might have permitted the pregnancy to go to term. If premature detachment of the placenta once occurs it is almost impossible to save the life of the fetus, but here again modification in the conduct of pregnancy and labor might have controlled the factors which eventually led to the separation. In competent hands the knowledge which we now possess is capable of reducing infant and fetal mortality rates to at least half of the current rates for the country as a whole. As our knowledge increases a nearer and nearer approach to the "irreducible minimum," which consists only of malformation, will be made and eventually perhaps even the cause of these will be discovered.

The fields in which the most reduction can at present be made are in those deaths due to trauma sustained during labor, to pneumonia, and in some parts of the country those due to syphilis.

The most common causes of death are as yet unsolved as to basic etiology and no known methods of prevention exists. The greatest saving of lives would be effected by the discovery of the cause of antepartum fetal death in nontoxic nonsyphilitic women, of the cause of premature onset of labor, and in the prevention of premature detachment of the placenta and placenta praevia.

Chicago Lying-In Hospital and Dispensary.

ABSTRACT OF DISCUSSION

DR. LUDWIG A. EMGE, San Francisco: Dr. Potter's talk is timely. Yesterday I pointed out in my chairman's address that the value of our efforts is greatly enhanced by cooperation. If physicians at large would be more cooperative in obtaining permission for autopsy the study of fetal and neonatal deaths would be greatly facilitated. Constituted authorities, particularly the health officers, are anxious for better information on infant deaths. Only if we cooperate to the fullest extent can this be achieved.

DR. EDITH L. POTTER, Chicago: I did not have time to show all that came out of this study. I have been glad of the opportunities afforded for autopsy study and I am grateful to the members of the Chicago Board of Health for their cooperation. If much is to be accomplished in the further reduction of neonatal deaths, it must be aided by individual investigation in individual hospitals. This series shows only general trends; it shows what is happening in our part of the country. If each individual hospital could examine its own infants and find out what is happening in that particular group, the obstetricians and the pediatricians would be stimulated. One frequently hears the statement that it is not worth while to "post" a baby because so little is usually found. In the material that I showed, only 5 per cent of the infants at term who were born alive failed to show some definite change at autopsy. It is just as important, however, to have negative observations as it is positive ones. It is just as important to know that an intracranial hemorrhage, a rupture of the liver or pneumonia is not present as it is to have those things definitely demonstrated.

DERMATITIS OF THE HANDS IN HOUSEWIVES

ROLE OF SOAPS IN ITS ETIOLOGY AND METHODS FOR ITS PREVENTION

JAMES W. JORDON, M.D.
FRANK A. DOLCE, M.D.
AND
EARL D. OSBORNE, M.D.
BUFFALO

Eczematous dermatitis of the hands in housewives is one of the commonest and most refractory conditions for which dermatologists are consulted. Although we recognize that a diversity of allergens may cause this type of dermatitis, it is our belief that the majority of cases are caused by hypersensitivity to ingredients of soaps and allied cleansers.

In 1936 we[1] did extensive patch test experiments both on normal individuals and on patients who had an eczematous type of dermatitis in an attempt to determine the allergenic properties of soaps. The results of that study convinced us of the importance of soaps, laundry preparations and allied household cleansers in the production of eczema.

In this study we discuss the pertinent chemistry of soaps and allied cleansers, report our observations on the clinical features of housewives' eczema due to these substances and evaluate patch tests as a diagnostic procedure in individual cases. Methods of prevention and control of this common condition will be discussed.

Soap, by definition, is a metallic salt of a higher fatty acid but, for practical purposes, because all others are insoluble, only the sodium, potassium or, rarely, ammonium salts are used for cleansing purposes. Soap manufacturers employ a large number of fats and oils both of animal and of vegetable origin in the manufacture of soap. Fats and oils are a mixture of the glycerides of the higher fatty acids. The type and amount of fatty acids present in a fat or oil depend on its origin. The animal fats and oils contain chiefly stearic, palmitic, oleic and linolic acids. Certain of the vegetable fats and oils, in addition to these, may contain lauric, myristic, capric and small quantities of other fatty acids. Soaps, therefore, are mixtures of the alkali salts of these fatty acids. The types and percentages vary with the fats or oils used in the manufacture of the soap.

Soap as it is marketed is not a simple mixture of the sodium or potassium salt of the higher fatty acids but contains a great many other substances, among them rosin, which may be present in quantities as high as 30 per cent. Sodium silicate, or water glass, may be present in poor soaps in quantities as high as 40 per cent. Sodium carbonate and trisodium phosphate are commonly present in soap powders. Naphtha and borax may be present. Numerous perfumes which are mixtures of essential oils, gums, resins, balsams and animal products such as ambergris, musk and civet, along with synthetic perfumes, are employed. Many of these compounds are well known eczematizing agents.

From the Department of Dermatology and Syphilology, University of Buffalo School of Medicine.

Read before the Section on Dermatology and Syphilology at the Ninety-First Annual Session of the American Medical Association, New York, June 12, 1940.

1. Jordon, J. W.; Walker, H. L., and Osborne, E. D.: Studies in the Eczematizing Properties of Soaps, New York State J. Med. **36**: 791-795 (May 15) 1936.

All soaps in aqueous solution undergo hydrolysis to a greater or lesser extent and thus are split up into free alkali and free fatty acid. The degree of hydrolysis depends somewhat on the fatty acids employed in the manufacture, the temperature of the solution and the concentration of the soap. Even a neutral soap, therefore, liberates free alkali when in solution. Some observers are of the opinion that specific hypersensitivity to alkalis is not uncommon. The fatty acids also in themselves are potential eczematogenous agents. Blank [2] found that fatty acids of low molecular weight, particularly those derived from coconut or palm kernel oil, were in themselves irritating to the skin and that the higher fatty acids, such as palmitic, oleic and stearic, in the presence of alkali were also irritating to the skin. Dermatitis from certain fatty acids has been reported from time to time in the literature.[3]

In this paper the term soap is employed in a broad sense and means the sodium or potassium salt of the higher fatty acids, together with any substances which may be added to the final product as marketed.

During the past four years we have observed 239 patients in private practice who had a dermatitis on the hands, with or without involvement of other areas, in whom soaps appeared to be the exciting cause. Of these patients 61 per cent were housewives or domestics doing general housework. The remaining 39 per cent were for the most part engaged in occupations that required frequent contact with soaps and allied cleansers. Among them were dishwashers, cooks, hairdressers, bartenders, surgeons, nurses and orderlies. All age groups were represented but most patients were between the ages of 20 and 40. The average period from the time of the first attack of dermatitis of the hands until the patient came under our observation was three years. The longest period was twenty years, the shortest one week. The group had used fourteen different toilet and fifteen different laundry soaps, flakes or powders. All had employed two or more and many several of these cleansers. We were unable to determine from their histories whether or not certain brands of cleansers were more apt to produce eczema than others.

Based on the histories of these 239 patients and on our clinical observations and studies, we believe that the following are the cardinal features of eczema due to soaps and allied cleansers: Most patients in whom the first attack of dermatitis appeared more than a year before they came under our observation noted that they were either completely free from the condition or improved during the warm months. A high percentage of the patients noted improvement during periods of vacation, illness or other lapses in routine when soap and cleansers were used infrequently. Many patients observed that an attack was precipitated or an existing dermatitis made worse when these substances were frequently used. Nearly all patients reported periods of exacerbation and quiescence, and many patients had periods of complete freedom lasting from a week to several years.

In most instances the dermatitis was vesicular and was confined to areas on the hands. In general it was worse on the right hand of right-handed women and on the left of left-handed women. It seldom involved the entire dorsal aspects of the hands. Most patients had patches on the dorsum of the hands with involvement of one or more of the fingers. The interdigital areas were frequently involved, the palms rarely. The next most commonly involved area was the wrist. In a few instances the dermatitis spread to the forearms and arms and other areas uncovered by clothing. In such instances the flare-ups usually coincided with the doing of laundry or other work that involved the immersion of the hands and arms into solutions of soaps or allied substances. When the face was involved, the patient usually had been exposed to steam and fumes arising from hot solutions of these substances.

The eczema in many of our cases had been erroneously diagnosed as ringworm and nearly all long-standing cases had run the gamut of ringworm remedies. They were either unimproved or made worse by treatment of this type. The diagnosis in our cases was made by a carefully taken history including the duration of the condition, the frequency of exposure and the types of soap and allied cleansers employed in the household. The patients were carefully questioned regarding improvement when these substances were infrequently handled and whether exacerbations occurred following more than the usual degree of exposure. Many of the patients had been observed during several acute attacks. Most patients admitted that attacks came when they had become careless in carrying out preventive measures. All were questioned about contact with other eczematizing substances and these substances were ruled out as a cause of the dermatitis either by history, observation or patch tests, the limitations of the latter procedure being borne in mind.

Patch tests were done almost as a routine during the first two years of this study. We found that they were of very limited value as a diagnostic procedure in individual patients, since it was impossible to duplicate by patch test studies the actual conditions of contact. Such factors as the degree and frequency of exposure, which are of paramount importance in soap dermatitis, cannot be duplicated by patch tests. The alkali present in a drop of soap solution applied as a patch test is rapidly neutralized by the acids present in the sweat and, although we do not believe that alkali is the important eczematizing substance of soap, Blank [2] has shown that the fatty acids usually employed in the manufacture of soap are more irritating to the skin in the presence of alkali. Obviously, when the hands or arms are immersed in large amounts of soap and cleansers the alkali is not neutralized. We therefore have discontinued patch tests as a routine diagnostic measure in suspected cases and depend on the history and clinical observations.

In our previous communication [1] we expressed the opinion that eczematous responses to patch tests with soap solutions in dilutions greater than 1:100 in most patients represented an allergy to one or more of the ingredients of the soap to which the patient reacted. This view was based on the relative infrequency of eczematous reactions to dilute soap solutions among patients with normal skins and the frequency of reaction among those who had eczema. Later, Osborne and Walker [4] in patch test experiments on the skin of newborn babies found that none reacted in an eczematous manner to a soap solution in a dilution of 1:100 and thus demonstrated that this dilution of soap does not

2. Blank, I. H.: Action of Soap on Skin, Arch. Dermat. & Syph. **39**: 811-824 (May) 1939.

3. Hailey, W. H.: Dermatitis from Oleic Acid, Arch. Dermat. & Syph. **8**: 530 (Oct.) 1923. White, R. P.: The Dermatergoses, New York, Paul B. Hoeber, Inc., 1929.

4. Osborne, E. D., and Walker, H. L.: Contact and Environmental Allergens as a Cause of Eczema in Infants and in Children, Arch. Dermat. & Syph. **38**: 511-538 (Oct.) 1938.

produce an eczematous response owing to primary irritation or inherent hypersensitiveness in the infant. Those reactions encountered in later life must therefore in most instances be due to a specific altered epidermal response that causes the skin to react in an eczematous manner to the ingredients of soaps. Patch tests when strongly positive (vesicular or papulovesicular) are of diagnostic value but many patients with eczema due to soaps proved by clinical observation give negative responses to these tests.

The allergic nature of eczemas due to soaps and allied cleansers was further demonstrated by clinical observation of our patients. Most had been using the same soap or cleanser for weeks, months or years before an eczematous dermatitis appeared. Following the appearance of the eczema, they were unable to tolerate to the same extent a preparation which previously had caused no difficulty.

METHODS OF PREVENTION AND TREATMENT OF SOAP DERMATITIS

During the first two and a half years of this study we attempted to allow healing of existing lesions and prevent recurrences of the dermatitis by instructing our patients to wear cotton gloves covered by rubber gloves whenever it was necessary to perform household duties that required the use of soaps or allied cleansers. The purpose of the cotton gloves was to absorb moisture and prevent irritation from rubber. We employed olive oil or liquid petrolatum to cleanse the affected areas of the skin, since there was no good detergent that was available as a substitute for soap. The only other measures employed were the use of simple soothing wet dressings, ointments or lotions, depending on the degree and severity of the dermatitis. Under this regimen the dermatitis in nearly all cases improved or disappeared. If definite improvement was not manifest at the end of two weeks, other possible undiscovered allergens were searched for as a cause. These measures were efficacious in controlling acute attacks of soap dermatitis. Most of our patients, however, found it impracticable to avoid soaps and allied cleansers for long periods of time and thus had recurrences. It was apparent that the only solution to the problem of soap dermatitis lay in the substitution of some soapless detergent that could be employed both for toilet and for general household use. Such a detergent, to meet all the requirements of a suitable substitute for soaps and allied cleansers, must itself have a low sensitizing index, be nonirritating to the skin, compare closely to soap in cost and have physical properties that permit it to be marketed in liquid, bar or powdered form. Blank [2] recently investigated and reported on the use of a mixture containing a sulfonated oil as a substitute for soap in cases of soap eczema. He found that the compound he employed was relatively nonirritating and had good detergent properties.

During the past sixteen months we have had 150 patients use this mixture as a substitute for toilet soap. Seventy-nine of these were housewives with eczema due to soaps. The remaining seventy-one patients had some other dermatoses. Many used the compound as a shampoo. Fifty-one of the seventy-nine patients who had a soap dermatitis were entirely free from the eruption or the eruption was greatly improved as long as they used only the oil and avoided all contact with soaps or allied cleansers. Twenty-six were not seen after the preparation had been prescribed and two of the patients had a flare-up of the dermatitis following the use of the compound. Sixty-six of the seventy-one patients who had some dermatosis other than soap eczema and who used this compound tolerated it well. Four were not seen after the preparation had been prescribed and one tolerated it satisfactorily for four weeks, and then suddenly an acute dermatitis developed from its use. A patch test done with the oil was strongly positive. This was the only definite instance of allergy that developed among our 150 patients following the use of this sulfonated oil.

All the patients were satisfied with the cleansing action of the compound; many used it in a routine manner as a shampoo. Most patients, however, found it an unpractical substitute for soaps. Since it is a liquid, it is not suitable for the bath and it cannot be used for general household cleansing purposes. Its cost is prohibitive for long continued use as a substitute for toilet soaps by most patients. The preparation, therefore, fulfils only a few of the requirements for an ideal substitute for soaps and allied cleansers.

During the past year we have been investigating the alkyl sulfonates [5] for their possibilities as substitutes for soap and household cleansers. These compounds can be made by the sulfonation of higher fatty alcohols derived from the fatty acids ordinarily used in the manufacture of soap or from cheaper substances such as petroleum derivatives. The compounds thus obtained are solids and therefore can be prepared in bar form for toilet use or in powdered form for general household cleansing purposes. They are neutral in reaction and do not hydrolyze as do soaps and can be used with either acids or alkalis. Their calcium and magnesium salts are soluble in water and therefore they leave no deposit of these salts as a scum in bathtubs, sinks or other receptacles and no greasy spots in clothing. They are much more effective as emulsifying and detergent agents than are soaps and are stable under ordinary atmospheric conditions. They do not oxidize or turn rancid as do soaps. These compounds can be prepared and marketed at a cost that compares favorably with soap and have been employed extensively in the textile industry as a substitute for soap with marked success.

Some of these compounds have been used during recent years as a substitute for soap in shampoos, tooth pastes and powders and liquid dentifrices. Kitchin and Graham [6] investigated the alkyl sulfonates as a substitute for soap in dentifrices and found them superior to soap as a detergent. They noted no evidence of inflammation of the soft tissues of the mouth from their use. Epstein and his co-workers [7] studied these compounds for possible toxic effects that might follow accidental ingestion of them. They found them as harmless as soap.

The foregoing makes it apparent that this group of compounds is an ideal substitute for soap in cases of housewives' eczema due to soap and allied cleansers from the standpoints of comparative cost and physical properties. We therefore have attempted to determine whether they had the other two requirements of an ideal

5. Griffith, I.: Pharmaceutical Applications of Sulfonated Lauryl Alcohol and Kindred Products, Am. J. Pharm. **106**: 176-177 (May) 1934. Redgrove, H. S.: Higher Fatty Alcohols in Cosmetics, Am. Perfumer **38**: 35, 1939. Zimmerman, H.: The Search for Textile Detergents, Can. Chem. & Met. **21**: 366, 1939.

6. Kitchin, P. C., and Graham, W. C.: Sodium Alkyl Sulfate as a Detergent in Tooth Paste, J. Am. Dent. A. **24**: 736-755 (May) 1937.

7. Epstein, S.; Thorndson, A. H.; Dock, William, and Tainter, M. L.: Possible Deleterious Effects of Using Soap Substitutes in Dentifrices, J. Am. Dent. A. **26**: 1461, 1939.

soap substitute; that is, whether they were nonirritating and had a low sensitizing index.

The alkyl sulfonate employed in this study is known chemically as lauryl sulfoacetate but, since pure lauryl alcohol is not available commercially, the compound, in addition to the chief ingredient, contains variable amounts of alkyl sulfonates derived from other higher alcohols present in the material from which it is synthesized. Patch test experiments were done with this compound on 150 patients to determine whether it was irritating to the skin. The tests were applied in dilutions of 1:10, 1:25, 1:50 and 1:100. They were left on the skin for twenty-four hours and read at the end of that time and again in forty-eight hours and seventy-two hours. Ninety of the 150 patients chosen had an eczematous dermatitis; the remaining sixty had no known allergic condition. A few of the subjects developed a mild erythema from dilutions of 1:10. These reactions were considered to be of no significance. Three of the ninety eczematous patients developed papular to papulovesicular reactions to one or more of the dilutions. One of these had a mild papular reaction to a 1:10 dilution and a mild erythema to the other dilutions; the other two had vesicular reactions to dilutions of 1:10 and 1:25 and papular reactions to dilutions of 1:50 and 1:100. One of these three patients had previously had a dermatitis from a shampoo containing an alkyl sulfonate. We were unable to elicit a history of any contact with alkyl sulfonates from the other two. None of the sixty nonallergic patients gave a positive reaction. The tests, therefore, demonstrated that in the concentrations employed the substance studied was not a primary irritant.

Patch tests of this type do not give an index of the sensitizing properties of the substances employed, since most of the subjects chosen may not have had previous contact with these compounds and therefore no opportunity to develop sensitization to them. To determine the cutaneous sensitizing index of a compound, it is necessary to use it on the skin for a variable period of time and determine whether a sensitization dermatitis ultimately results from repeated exposure to the substance.

There have been rare reports in the literature of dermatitis venenata from these compounds [8] and prior to this study we observed two instances of sensitization dermatitis from their use. One patient developed a severe dermatitis from the use of a shampoo, and another from a tooth powder containing an alkyl sulfonate. However, considering the extent of the use of these compounds in the textile industry and more recently in shampoos, dentifrices and cosmetic preparations, with the paucity of reports in the literature of dermatitis from their use, they did not appear to be very active eczematizing agents.

We instructed twenty-seven patients who were allergic to soaps to use cakes made of the compound undiluted as a substitute for soap. Twenty-six of the patients tolerated the preparation satisfactorily. One of the group, a man who had polysensitivities, used the substance for two weeks and then a dermatitis developed from its use. A patch test was done with a 10 per cent solution of the preparation and a papular reaction developed at the end of twenty-four hours.

8. Biederman, J. B.: Sensitivity to Drene Shampoo, New England J. Med. **217**: 1088-1089 (Dec. 30) 1937. Carpenter, C. C.: Dermatitis Produced by Hymolal Salts (New Soaplike Material), Arch. Dermat. & Syph. **30**: 517 (Oct.) 1934.

In addition to the compound containing lauryl sulfoacetate we have also been studying another of the alkyl sulfonates, aryl alkyl sulfonate. This alkyl sulfonate is manufactured from a petroleum derivative and is therefore much cheaper than the alkyl sulfonates manufactured from the fatty alcohols. The compound is markedly detergent and, because of its low cost, may be a suitable substitute for laundry soaps and for other general household cleansers.

The compounds mentioned are markedly efficient as emulsifying agents of cutaneous fats and, in full strength, are too detergent for the human skin. High concentrations produce excessive dryness of the skin through removal of cutaneous fats. To make a suitable toilet preparation, it is necessary to use these compounds in low concentrations in suitable vehicles. They can be put in aqueous solution and used the same way as liquid soap or in oil, or water in oil preparation, or they can be incorporated in a suitable nonirritating, water soluble, solid, inert substance. Our experience up to the present time indicates that 10 per cent lauryl sulfoacetate in a suitable vehicle is as detergent as most toilet soaps. In this concentration it does not produce excessive dryness.

While a certain number of patients undoubtedly will develop sensitization dermatitis from the prolonged use of these compounds, it is our opinion that they are not primary irritants or highly eczematizing in concentrations sufficient for cleansing purposes. Our studies lead us to believe that they come closest to an ideal substitute for soap that has yet been developed, since they compare favorably with soap and other cleansers in cost, they are solids and they can be used for toilet, laundry and general household cleaning purposes. They are nonirritating to the skin in concentrations sufficient for cleansing purposes and have a low sensitizing index.

SUMMARY

1. Soaps and allied cleansers are important causes of eczema of the hands in housewives or others whose occupations require frequent exposure to them.

2. The important clinical features of eczema due to soaps and allied cleansers include the following: (*a*) The eruption is usually vesicular with a patchy distribution on the dorsum of the fingers, hands and occasionally other exposed areas. (*b*) The eczema tends to improve in warm weather and in general is better or worse, depending on the degree and frequency of exposure to these substances. (*c*) Many of these cases are erroneously diagnosed as ringworm and unsatisfactorily treated as such.

3. Patch tests are of limited value in the diagnosis of individual cases, but when they are positive in dilutions of 1:100 or greater they indicate an allergy to one or more of the soap ingredients.

4. Methods of prevention and control depend on (*a*) avoidance of contact with soaps and allied cleansers, (*b*) local applications consisting of soothing wet dressings, lotions and ointments and (*c*) the use of suitable substitutes for soap and allied cleansers.

5. A sulfonated oil has advantages and disadvantages in comparison with the alkyl sulfonates as a substitute for soaps. We believe that the latter group of compounds, when used in suitable concentrations, most closely approximate the ideal soap substitute available at the present time.

471 Delaware Avenue.

ABSTRACT OF DISCUSSION

DR. JOSEPH V. KLAUDER, Philadelphia: I do not believe that the compound soap is allergenic. Excluding medicated soaps, the notable allergenic ingredients of soap are dyes, perfumes and essential oils. I believe the role that soap plays in the causation of dermatitis of the hands in housewives and others concerns the defatting action of soap but more especially the prolonged exposure to soap as an alkaline substance. Burckhardt's studies suggest that the eczematogenous action of soap is inherent to impairment of the function of the skin to neutralize alkali, whereby an alkaline reacting substance becomes an irritant in a concentration to which the normal skin does not react. Burckhardt called this toxic hypersensitivity. This serves, I believe, in explanation of the eczematogenous action of all alkaline cutaneous detergents. If a positive patch test to soap is an allergic one, it should be positive in a wide range of dilution of soap. It is desirable in a study of patch tests to soap to perform also tests such as Burckhardt outlined in the direction of determining if the function of the skin to neutralize alkali is impaired. In this way it could be determined whether a positive patch test to soap correlates an impaired function of the skin to neutralize an alkali. An important phase in prevention of dermatitis caused by prolonged exposure to soap, indeed to any alkaline cleanser, is to immerse the hands at the end of the work day in a 1-3 per cent solution of acetic acid, indeed vinegar. The authors studied the use as soap substitutes of some organic preparations that have wetting, penetrating, emulsifying or detergent properties. I believe that all such preparations exert a defatting action. The authors call attention to this and therefore advise their use in a diluted form. The authors have made a notable contribution in mixing these detergents in a nonirritating, water soluble substance, urea, in order to employ them in cake form. They have observed determatitis—an allergic reaction resulting from an alkyl sulfonate and also from a sulfonated oil. Further use of these detergents will be required in order to determine whether the newer organic compounds are more allergenic than the sulfonated oils. An ideal cutaneous detergent should be neutral or on the acid side (about p_H 5); it should not have a defatting action and should have no or a low allergenic property. I believe that the balance now is in favor of the sulfonated oils.

DR. MARION B. SULZBERGER, New York: I don't think that any dermatologist has doubted for the last two decades that many eczematous eruptions of various types are either caused by or aggravated by the use of soap. It is the practice of the majority of dermatologists with whom I have conversed on the subject to tell the patient with eczematous dermatitis of the hands that soap is bad for the skin. In my practice, I have emphasized this more strongly by telling the patient that for his particular hands "soap is poison" and that he must avoid soap the way he would avoid a real poison if he wants to get well. There are other dermatoses in which soap may be very harmful. For example, senile pruritus is certainly one such dermatitis; winter itch and bath ich are others, and notably infantile eczema and atopic dermatitis (disseminated neurodermatitis) in the child and in the adult are often harmed by soap. And in infantile eczema I believe the role of soap is just as important as it is in dermatoses of the hands. There is a large group of important skin disorders in which soap must be avoided. How does the soap act? I am inclined to agree with the authors and others who believe that there is a combination of alkali damage plus irritation or sensitization to some other ingredient in the soap. That is, the alkali damage to the skin more or less paves the way for the other effects of perfumes, of fillers, of fatty acids and of other substances which may be contained in the soap and paves the way for sensitization or irritation from other substances not contained in the soap, such as occupational substances and other contact agents. The chief problem for years has been to find a satisfactory soap substitute. None of the soap substitutes submitted for my trial among patients have been entirely satisfactory for several reasons aside from the possibility of their also causing irritations and sensitizations on their own part. One objection is that they have not as yet been put up in cake form. The cake is an actual convenience. It is difficult to get people to carry a container, as they must now do if they are obliged to use soap substitutes. Another reason is that these substitutes cause no foam. People connect the foaming with the detergent effect, although of course this is not a necessary association. A third reason why patients do not like the present soap substitutes is that none of them leave that slippery feeling which people have been accustomed to associate with the feeling of cleanliness and of softness of the skin and which is due to alkali damage of the surface of the skin. The next difficulty is that these soap substitutes are not obtainable everywhere. People don't want to have to go to certain stores to get things. The fifth difficulty is the price. The soap substitutes are comparatively expensive at present.

DR. HERMAN GOODMAN, New York: The paper is restricted to conditions found in housewives. It is not impossible to find similar reactions in men. It is not the soap or substitute for soap which is at fault; the skin is the wrong soil for the soap. There are two kinds of skin. To bring the matter into the realm of soap making, I classify skin first as of the oil in water emulsion type. Normal soap is also of the oil in water emulsion type. If the patient's skin and the soap are both of the oil in water emulsion type, the patient's skin can tolerate the soap. Oil in water soaps are of two varieties: One is soluble, formed with fatty acid by univalent salts, as potassium, sodium and ammonium. The insoluble oil in water soaps are formed with fatty acid by bivalent salts, as magnesium and calcium. Many persons who tolerate soluble oil in water soaps react by evidence of skin irritation to insoluble oil in water soaps. It is held that the insoluble oil in water soaps are irritants to the skin of such people. The second kind of skin is regarded as the water in oil emulsion type, which does not tolerate oil in water phase soap. Every grandmother advised the substitution of oil for soap if a child did not tolerate soap and water. Substitution of oil in water emulsion type soap for another oil in water emulsion type soap does not relieve the person whose particular skin is of the water in oil emulsion type. Certain superfatted soaps were once available which purported to be in effect water in oil emulsion type. Many creams offered as a substitute for oil in water emulsion type soap are likewise oil in water emulsion type creams and are in effect conventional soap with high water content sold in a jar rather than the dehydrated oil in water emulsion type soap sold in cake form. The physician can learn only by trial and error whether his patient has the skin of the oil in water emulsion type or of the water in oil emulsion type.

DR. JOSEPH MULLER, Worcester, Mass.: On the practical side of this paper the question is what to do with the patient who has to use soap. In my experience it makes a great deal of difference how the soap is used, not only what soap is used. This holds true only with the patient who is in contact with soap for a comparatively short time. With the usual way of washing hands, for instance in hospitals, by nurses and orderlies and doctors, the trouble is that the soap remains on the hands after the washing is over; it is not thoroughly rinsed off. This way the irritating effect of soap lasts for a long time instead of a minute or two, as it would with proper rinsing. I think that, if we advise our patients to rinse their hands with lukewarm water very carefully after using soap, the milder cases of soap dermatitis will disappear without the use of substitutes instead of soap. The important thing is good rinsing with lukewarm water. Cold water does not dissolve the average soap and, of course, hot water causes inflammation by itself.

DR. ADOLPH ROSTENBERG JR., Washington, D. C.: Are most of the dermatitides which result from contact with soap predicated on a specific sensitization or on some other mechanism? This is an important point because it will shed light on broader questions of skin irritations and possibly lead to an understanding of some mechanisms of skin irritation which are poorly understood. I do not doubt that some cases of dermatitis which arise after contact with soap are predicated on a specific sensitization, but the weight of evidence points to the fact that the majority arise as a result of some other mechanism. In a paper presented before this section a few years ago by Dr. Sulzberger and myself on an analysis of patch tests, we reported that we had found a much greater incidence of positive patch tests to soap in atopic dermatitis than in cases of dermatitis venenata in which we had found the specific etiology. What does this mean? To me it is inconceivable that atopic dermatitis is predicated on a sensitization to soap. From all we know

of atopic dermatitis, it is not predicated on the epidermal type of sensitization at all. All the high incidence of reactions to soap in that type of dermatosis can mean is that those individuals have some functional abnormality of their skin which does not allow them to tolerate soap as do their fellow men. There is a great deal of ancillary evidence as well to show that their skin is not the same as the skin of other individuals. But what does the fact that the cases of dermatitis venenata did not give an inordinately high percentage of positive reactions to soap mean? Of course it can be argued that we just happened to fall on a group of individuals who had never become sensitized to soap. But assuredly those individuals had the opportunity to become sensitized to soap. It has also been shown that individuals who become sensitized to one eczematous allergen are much more prone to become sensitized to some other eczematous allergen. In view of those facts and of the work done by Burckhardt, all the evidence seems to point to the fact that reactions from soap are predicated on a mechanism other than a specific allergic sensitization. While I do not believe that this mechanism is understood at the moment, the importance of realizing this is to point out the direction in which further work should be continued.

DR. HOWARD J. PARKHURST, Toledo, Ohio: The authors mentioned that there were fewer of these cases in summer. That seems in line with observations of Hansen, who examined the p_H of the skin of the forearm after it had been washed for two minutes with toilet soap. He found that ordinarily it took three and one-half hours for the p_H of that area to return to normal, but only one-half hour if the patient was perspiring freely. Most observers feel that the free alkali itself is probably not an irritant but that it apparently prepares the skin for the action of various potential irritants such as those ingredients of soaps which the authors mentioned. I think we are agreed that some cleansing agent has to be used. Soaps or cleansing agents cannot be avoided, and I think we are also agreed that the offenders are a few of the stronger modern laundry soaps and the hard water toilet soaps chiefly, and also the water softeners. Sulfonated oil and sulfonated alcohol are of some value as substitutes, but I don't feel that they are as good cleansing agents as the soaps, and it has been shown that they themselves are occasional sources of irritation. Therefore I feel that it is better to substitute some milder soap. All are familiar with a number of them. And to use a better technic of washing or handling the soap, as has already been brought out in this discussion, in my experience has been all that has been required.

DR. DONALD M. PILLSBURY, Philadelphia: During the past year Livingood and myself have in about 200 cases employed various soap substitutes, wetting agents of various types incorporated in oils and with higher alcohols. We can confirm the value of such substitutes in cases of dermatitis of the hands, whether or not they seem to be due primarily to soap. They have been used in infantile eczemas and in ichthyosis. These compounds will often alone produce a satisfactory clinical improvement in ichthyosis which appears during the winter months. We have not encountered any particular evidence of allergenic capacity. I think that the final story as regards their allergenic capacity will not be told until a considerable number of persons have used these compounds over a long period of time.

DR. JAMES W. JORDON, Buffalo: It has been our impression from patch tests and other studies that the alkali present in soap is not the most important factor in soap dermatitis. The alkali, however, does pave the way by its degreasing action on the skin in permitting other allergens to sensitize the skin. If alkali alone were the cause of soap dermatitis, sulfonated alcohols would solve the problem since they contain no alkali and are neutral in reaction and do not hydrolyze. The sulfonated alcohols in undiluted form produce excessive dryness of the skin so that it is necessary to incorporate them in inert bases. So far, we have not prepared an ideal preparation but have been using a compound containing 10 per cent lauryl sulfoacetate, 88 per cent urea and 2 per cent unsulfonated lauric alcohol. The lauric alcohol causes a smooth satin-like feeling to the skin following the use of the compound. I agree with Dr. Sulzberger that there are many dermatoses in which soaps play an important part such as senile pruritus, winter itch and bath itch. We also believe that many low grade eczemas are due to sensitization to insoluble soaps present in laundered materials. We agree with Dr. Goodman that the type of skin is of some importance in soap dermatitis. People with oily skins will tolerate soap better than those with dry skins. Ichthyotic persons tend particularly to develop soap dermatitis, sometimes in primary irritation and sometimes because of sensitization to ingredients of the soap. We believe that soap dermatitis is more common in the winter time because the skin is drier at that time. Regarding patch tests with soap solutions, we did 2,600 different tests some time ago, using various dilutions of soap, and our results do not agree with those of Dr. Rostenberg. We found that 50 per cent of all patients who had eczema developed strongly positive patch test reactions to one or more of the soaps to which they were tested. Furthermore, we found that most patients did not react to all of the soaps employed but usually to two or three, in spite of the fact that the alkali content of the soaps employed was approximately the same. This indicates that it was not the alkali present in the soap but perhaps a fatty acid or something else added to the soap that produced the reaction. We have used the so-called milder soaps and superfatted soaps and have been unsuccessful in controlling soap dermatitis.

SOME FACTORS AND OBSERVATIONS ON PREPARATION AND PRESERVATION OF DILUTE PLASMA

JOHN ELLIOTT, Sc.D.
G. F. BUSBY, M.D.
AND
W. L. TATUM, M.D.
SALISBURY, N. C.

The importance of whole blood transfusion as a therapeutic agent is well recognized and established. The important role played by plasma in transfusion has not been fully appreciated. In the past the major criterion for transfusion in the majority of institutions has been the need for erythrocytes. From the ever increasing reports in the literature it is becoming apparent that the therapeutic value of transfusion in the treatment of many diseases is derived largely from the plasma rather than from the red cells. Certainly in shock without hemorrhage,[1] in burns,[2] for restoration and maintenance of plasma protein,[3] for administration of antibodies [4] and even in severe hemorrhage [5] the effectiveness of plasma cannot be questioned.

The necessary delay in securing a suitable donor or in cross matching "banked" blood, if it is available, vitiates the effectiveness of transfusion in dire emergencies. Blood transfusions can be carried out successfully in a great majority of hospitals and, under favorable circumstances, in the home. Yet there are a number of small institutions without adequate facilities for matching and transfusing blood. Transfusion in the home is, at best, tedious and complicated. The need is as great in the one institution as in the other. There-

From the laboratory of pathology, Rowan Memorial Hospital.
Read before the American Human Serum Association, New York, June 10, 1940

1. Tatum, W. L.; Elliott, John, and Nesset, N. M.: A Technic for the Preparation of a Substitute for Whole Blood Adaptable for Use During War Conditions, Mil. Surgeon **85**: 481 (Dec.) 1939. Strumia, M. M.; Wagner, J. A., and Monaghan, J. F.: The Use of Citrated Plasma in the Treatment of Secondary Shock, J. A. M. A. **114**: 1337 (April 6) 1940. Levinson, S. O.; Neuwelt, Frank, and Necheles, Heinrich: Human Serum as a Blood Substitute in the Treatment of Hemorrhage and Shock, ibid. **114**: 455 (Feb. 10) 1940.

2. Trusler, H. M.; Egbert, H. L., and Williams, H. S.: Burn Shock: Water Intoxication as a Complication, J. A. M. A. **113**: 2207 (Dec. 16) 1939. Strumia, Wagner and Monaghan.[1]

3. McKenzie, B. W., and Elliott, John: Blood Plasma Proteins in Pyogenic Infections, South. Med. & Surg. **97**: 7-10 (Jan.) 1935.

4. Thalhimer, William: The Value of Convalescent Scarlet Fever, Measles and Mumps Serums in Prophylaxis and Therapy, M. Clin. North America **23**: 613 (May) 1939.

5. Tatum, Elliott and Nesset.[1] Levinson, Neuwelt and Necheles.[1]

fore the need for an effective immediately available substitute for whole blood makes itself apparent. To be most effective, stability and ease of administration, without special preparation at the time of need, are of paramount importance. We have endeavored to show in other publications [6] that plasma is such a substitute. Reports in the literature of its extensive use in many different types of cases clearly indicate its effectiveness. Its simplicity of administration and freedom from reactions enhance its usefulness.

In 1936 we suggested the use of blood plasma as a substitute for whole blood.[7] At that time we were unable to find a method for preparing plasma in sufficient quantities for clinical use. Our first problem was therefore to devise a suitable method of preparation. For a method to be satisfactory for practical clinical use it was of the utmost importance that it meet certain criteria, namely:

1. Ease of maintaining an aseptic technic.
2. Universal adaptability.
3. Simplicity (plus economy in raw material, time and effort).
4. Ease and safety of storage and transportation.

Our first concern was the sterile collection of blood. After much experimentation we became convinced that the most satisfactory collecting flask for whole blood would be one containing an anticoagulant in a vacuum. This would permit the aseptic collection of blood in an entirely closed system. The result of this experimentation has become commercially available.

A technic for the preparation of plasma was developed and a similar vacuum container adapted to its preservation. With the development of this equipment and technic the practical preparation of plasma can be successfully carried out even in small laboratories. It can be administered with the simplicity of other parenteral fluids in any institution or in the home. Storage under widely varying conditions has not influenced its usefulness, and transportation for long distances has been found possible.

Our original idea in 1936 was to suggest the preparation and preservation of undiluted, uncentrifuged plasma to be stored without a preservative. It was not long, however, until we found precipitation occurring. In addition, plasma so prepared proved difficult to administer. Often our preparations were unusually cloudy owing to the presence of large quantities of fat. This was particularly true when our donors had eaten heartily. Cloudiness often suggested contamination, making bacterial cultures imperative before administration.

We soon found that, by centrifuging, clear plasma could be obtained, and by using fasting donors the plasma would be relatively free of fat. However, this clear plasma developed a precipitate after a few days storage. Gross precipitation was delayed by dilution with physiologic solution of sodium chloride to approximately the original blood volume. It was noted that, when plasma was prepared from whole blood less than twenty-four hours after collection, precipitation often occurred relatively soon, even after dilution. This did not occur when older blood was converted. Consequently, we are now storing all blood before it is converted. Through personal communication we are under the impression that an explanation for this difference in behavior will shortly be forthcoming.

Hemolysis is insignificant in plasma prepared from blood stored for periods up to five days.[8] Agitation of older blood results in an undesirable mixing of hemoglobin with the plasma. This can be prevented by transferring blood from the original container to centrifuge bottles without shaking.[9] Our first preparations were made by aspirating the supernatant plasma from the centrifuge bottle into the storage container immediately after centrifugation. However, as our centrifuge came to rest, invariably there was a swirl of cells through the supernatant plasma. When the supernatant plasma was aspirated, these cells came with it. These few cells, though not sufficient to cause reaction, were eventually destroyed, producing undesirable color and increased precipitation. This difficulty was eliminated by placing the centrifuge bottles in the refrigerator for twelve hours after centrifugation before the supernatant plasma was aspirated.

By means of this technic and equipment, complete asepsis has been achieved without resorting to special precautions. One hundred and fifty consecutive tests for sepsis on plasma prepared without a sterilizing preservative yielded negative cultures. Some of these specimens of diluted plasma had been stored at room temperature for eighteen months. In spite of this record we felt that additional safety could be assured by the addition of merthiolate as a preservative. We have used as a routine 5 cc. of a 1 per cent solution in 500 cc. of diluted plasma, giving a final concentration of 1 : 10,000. The low toxicity of merthiolate and its effective germicidal action in protein mediums [10] suggested its use. Observations in the literature, clinical trial and personal communication would all seem to justify this action. Plasma thus protected was inoculated with staphylococci and streptococci, stored at room and at refrigerator temperatures and was found to be sterile when cultured twenty-four hours after inoculation. Four bottles of plasma containing merthiolate in a concentration of 1 : 10,000 have been exposed to the air at room temperature for periods up to seven months. Frequent aerobic and anaerobic cultures have been negative.

The electrophoretic protein patterns of a year old diluted plasma were studied by Drs. Scudder and Longsworth of the Rockefeller Institute. They found some changes in the albumin and in the alpha, beta and gamma fractions of the globulin. The significance of these changes is not apparent. Chemical studies were made at Presbyterian Hospital in New York on six specimens of diluted plasma preserved from forty-five to 145 days. These studies included determinations of potassium, sodium, ammonia, hydrogen ion concentration and sterility. They gave no evidence of deterioration with age. Hydrogen ion concentration studies on diluted plasma at Duke University gave a mean reading of 7.6.

A variety of diluents have been tried and the one which has been generally used is physiologic solution of sodium chloride. However, recent studies seem to indicate that a solution of 5 per cent dextrose in physiologic solution of sodium chloride possesses certain advantages over the simple saline solution. Preliminary observations indicate that it possesses greater inhibitory power as to the formation of color and precipitates in plasma stored at room temperature for some period of time.

6. Tatum, Elliott and Nesset.[1] Elliott.[7] Elliott, Tatum and Nesset.[8]
7. Elliott, John: A Preliminary Report of a New Method of Blood Transfusion, South. Med. & Surg. **98**: 643 (Dec.) 1936. Elliott, John; Tatum, W. L., and Nesset, N. M.: The Use of Plasma as a Substitute for Whole Blood, North Carolina M. J. **1**: 283-289 (June) 1940.

8. Much of our plasma is salvaged from outdated blood from the blood bank. Fifty-eight specimens of blood have been shipped to us by bus or mail. All these have been converted to very clear, satisfactory plasma.
9. Containers will soon be available which will not require this transfer.
10. Powell, H. M., and Jamieson, W. A.: Merthiolate as a Germicide, Am. J. Hyg. **13**: 296-310 (Jan.) 1931. Literature, Eli Lilly & Co.

Objections to the dextrose content have been raised on the ground that it might slow absorption when given extravascularly. Frequent intramuscular administrations have been given without any obvious difference in rates of absorption.

In the course of our studies it has frequently been noted that when dilute plasma has been prepared containing hemoglobin and stored at room temperature there was a marked change in color drifting through various shades, finally stabilizing as a muddy, chocolate colored solution. An absorption spectrographic study identifies this shifting color as being due to the formation of methemoglobin. The addition of either sodium cyanide or sodium hydrosulfite rapidly converts the chocolate colored solution back to a clear pink, which is readily recognized as being a dilute solution of hemoglobin. These observations would seem to give positive evidence that the hemoglobin is oxidized to methemoglobin. It is interesting to note that as low a concentration as 0.2 per cent methemoglobin can be responsible for a very unsatisfactory looking product.

While the precipitate previously mentioned has not been positively identified, the studies to date indicate that it is essentially proteinaceous in character. After separation and washing three times with distilled water it gives characteristic protein reactions, is soluble in citric acid solution and remains in solution at a p_H of 5. It is appreciably soluble in dilute alkalis. Colorimetric tests for albumin and globulin indicate their presence in only minute quantities. Nitrogen determinations on this precipitate dried at 60 C. gave a value of 12.48 per cent. The addition of calcium chloride to the supernatant dilute plasma from which the precipitate had been removed by centrifugation results in no clot formation. While this precipitate has not been positively characterized, as a result of the foregoing observations it would seem reasonable to assume that it is fibrin. We are continuing our studies in an effort to identify this material positively.

Approximate Age of Plasma When Administered

1 Day to 1 Week	App. 2 Weeks	App. 3 Weeks	App. 4 Weeks	App. 6 Weeks	App. 8 Weeks	App. 12 Weeks	App. 25 Weeks	App. 36 Weeks
22	3	1	2	3	5	8	6	3

Storage at refrigerator temperature is unquestionably optimum for plasma just as it is for whole blood. We have purposefully used plasma stored at room temperature for long periods of time to prove that it will not deteriorate, develop toxic products or lose its therapeutic effectiveness. We, of course, recognize the diminution, if not loss, of antibodies under these storage conditions and, consequently, make no claim as to its efficacy in the field of immunology after such storage. This study included fifty-three administrations. No reactions occurred. The storage period ranged from one to 270 days.

We wish to make a special note of the fact that five of the specimens of plasma traveled 17,000 miles in the United States and South America during a period of two months, starting the latter part of September 1939, and were subsequently stored in our laboratories for an additional four months. At no time during this period were these specimens protected from weather or climatic changes. A moderate precipitate and change in color were noted. Aerobic and anaerobic test cultures of two bottles were found to be sterile. The others were not cultured. Their therapeutic effectiveness is illustrated by the following case:

A middle-aged Negro was admitted to the Rowan Memorial Hospital, Salisbury, N. C., moribund and suffering with extensive gangrene of the penis, scrotum and lower part of the abdominal wall. He was unconscious and showed all the signs of having an advanced circulatory failure. Survival for more than a few hours was not expected. He was given within thirty hours eight bottles of diluted plasma, each representing the plasma from 500 cc. of blood. This included the five bottles previously mentioned and an additional three bottles which had been exhibited at several medical meetings and had been stored at room temperature for more than nine months.

Restoration of blood pressure, lowering of temperature, decrease in pulse rate, increased urinary output and a return to consciousness followed. Within twenty-four hours he was able to take nourishment and survived eighty-four hours. The recipient's blood belonged to blood group A and all the plasma was from blood belonging to group O. No unfavorable reaction of any kind occurred during this therapy.

Our observations have been confined to the preparation and preservation of dilute plasma. We have had no experience with the lyophile method of Florsdorf and Mudd,[11] the concentration method of Thalhimer[12] or the drying in a vacuum at body temperature method of Edwards, Kay and Davie.[13] All these methods have been reported as being highly satisfactory. The observations herein reported would not be applicable to their procedure.

CONCLUSION

In the past several years we have given 482 infusions with dilute plasma and have had but three reactions. In each instance in which untoward results were experienced they were unquestionably identified as being pyrogenic and caused by improper cleansing and preparation of the accessory equipment.

It is perhaps noteworthy that we have given plasma by means of the intravenous, subcutaneous and intramuscular routes, in some conditions with apparent equal clinical benefits. All plasma has been given with a recipient set containing a stainless steel filter which contains a 200 mesh stainless steel filtering cylinder. This cylinder removes all particulate matter of a magnitude greater than 74 microns in diameter.

A clear, dilute plasma in which little or no precipitate forms can be prepared by observing a few, simple precautions, namely:

1. The use of fasting donors.
2. The storage of whole blood for more than twenty-four hours before being converted to plasma.
3. The avoidance of shaking whole blood before it is transferred to centrifuge bottles.
4. Refrigeration for approximately twelve hours to permit sedimentation of red cells not removed by the centrifuge.
5. The use of a diluent containing dextrose.
6. The addition of merthiolate to a concentration of 1:10,000.

Dilute plasma prepared by our method is an effective substitute for whole blood. It is easily prepared. It is adaptable to all institutions. It has been administered safely and effectively after storage for periods up to nine months. Clinical use after storage under widely varying conditions, both in the home and in the hospital, indicates that it is a valuable and safe therapeutic agent.

11. Florsdorf, E. W., and Mudd, Stuart: J. Immunol. **29**: 389 (Nov.) 1935.
12. Thalhimer, William: A Simple Inexpensive Method for Concentrating Serum Under Sterile Conditions, Proc. Soc. Exper. Biol. & Med. **37**: 639-641 (Jan.) 1938.
13. Edwards, F. R.; Kay, J., and Davie, T. B.: The Preparation and Use of Dried Plasma for Transfusion, Brit. M. J. **1**: 377 (March 9) 1940.

Clinical Notes, Suggestions and New Instruments

ACUTE APPENDICITIS AND PINWORM INFESTATION OCCURRING CONCOMITANTLY IN THE SAME FAMILY

VICTOR MAYER, M.D., WARREN, PA.

The etiologic relationship of infestation with Oxyuris vermicularis to acute appendicitis in children has been shown frequently, though there is no ready agreement as to whether the parasite is to be considered the direct agent or concomitant and coincidental.

Dean Lewis,[1] in discussing this problem, finds that the parasite is found in apparently normal appendixes, in the submucosa as well as between. He suggests the possibility that the parasites often penetrate the mucosa and that this may be the starting point of an acute attack.

While infestation of entire families and institutional groups is not uncommon and while a so-called family tendency to acute appendicitis is known, the combination of the two in one family over a short period of time bears reporting.

The family is of Italian descent and lives in poor circumstances. The mother, Mrs. V. T., aged 34, was first known to be infested at the time of delivery of her seventh child in 1935. At this time the diagnosis of Oxyuris infestation was made on gross examination when she passed many parasites at delivery and in the puerperium. She received subsequent treatment for this but was not followed up.

The members of the family are Mr. T. aged 40 (?), Mary aged 15, Tony aged 14, Charles aged 12, Frances aged 9, Anna Jean aged 8, Nicholas aged 4 and Nicholas aged 6 at the time of his death eleven years before. (The cause of death cannot be determined exactly—said to be appendicitis.)

REPORT OF CASES

The following are the members of the family who have been seen so far:

CASE 1.—F. T., a girl aged 9 years, was admitted Dec. 13 1939, with a history of "pain in the stomach" beginning on the evening of Dec. 11, 1939. The next day she complained of pain in the right side. This persisted to the time of her admission. There was no nausea or vomiting associated with the attacks of pain.

The past history was negative. (It was later learned from the patient that she had perianal itching, particularly at night.)

The patient had mild pharyngitis. The heart and lungs were normal; the liver and spleen were not palpable. There was tenderness over McBurney's point and localized rigidity over this area. Pressure on the left upper quadrant produced pain in the right lower quadrant. The temperature, pulse and respiration were normal.

A blood count showed 4,850,000 red cells, 9,300 white cells and hemoglobin content 100 per cent; differential: polymorphonuclear leukocytes, segmented 36 per cent and nonsegmented 2 per cent; lymphocytes 54 per cent, eosinophils 6 per cent and transitionals 2 per cent. The urine was acid, with a specific gravity of 1.007, and reactions for albumin and sugar were negative. Microscopic examination revealed occasional epithelial cells, from 12 to 15 red blood cells per high power field, no casts and an occasional leukocyte. Eosinophils were not explained by the studies done. There was no urinary complaint. Because of the persistence of pain and tenderness that the patient suffered on admission, an appendectomy was done December 14. At operation the mother's history was recalled. The appendix was long, inflamed and retrocecal, with dense adhesions, particularly at the midportion, producing sharp angulation.

When the appendix was opened, a foul odor was obtained and it was found to be full of pinworms actively motile in a mucopurulent fluid.

A specimen of urine taken on the first postoperative day showed very few red blood cells and an occasional epithelial cell; otherwise it gave negative results.

The patient was discharged on the ninth postoperative day after a course of santonin and mild mercurous chloride. When she was seen two months later she had no further complaint.

CASE 2.—C. T., a boy aged 12 years, a brother of patient 1, was admitted Jan. 8, 1940, approximately two weeks after his sister's discharge, with a history of pain in the right side for two days. He had a nasal discharge and perianal itching at night. There was no nausea or vomiting. The past history was negative.

The patient had acute rhinitis and acute myringitis. The heart and lungs were normal. There were tenderness in the right lower quadrant of the abdomen over McBurney's point as well as over the ascending colon and slight rebound tenderness at the right lower quadrant. There was no demonstrable rigidity.

A blood count showed on admission 9,400 white cells; differential: polymorphonuclear leukocytes, segmented 40 per cent, nonsegmented 1 per cent; lymphocytes 46 per cent, eosinophils 13 per cent.

Analysis of the urine was negative. The temperature, pulse and respiration were normal.

Knowing the history of family infestation, a conservative plan of treatment was instituted. Immediately after admission hypertonic saline enemas were given and particular attention was paid to the hygiene of the hands and the perianal region.

On the day after admission, January 9, a blood count showed hemoglobin content 92 per cent, 6,450,000 red cells, 18,500 white cells; differential: polymorphonuclear leukocytes, segmented 74 per cent, nonsegmented 8 per cent; lymphocytes 18 per cent, eosinophils 2 per cent. The temperature, pulse and respiration were normal. There was no increase in the complaints concerning the abdomen. January 10 a blood count showed 10,300 white cells; differential: polymorphonuclear leukocytes, segmented 64 per cent, nonsegmented 4 per cent; lymphocytes 28 per cent, eosinophils 2 per cent, transitionals 2 per cent.

Ova were not demonstrated in the feces. Mucus and blood were present.

Because of the persistence of the abdominal complaint and improvement of the infection of the upper respiratory tract, an appendectomy was performed the next day and revealed the appendix with a short meso-appendix injected, full and tense. Parasites were not found in the opened appendix.

Convalescence was interrupted by a hematoma in the incision. The patient was discharged on the fifteenth postoperative day.

CASE 3.—T. T., a boy aged 14, was admitted on the evening of Feb. 5, 1940, approximately two weeks after discharge of his brother C. T.

Approximately five days prior to admission the patient had a "stomach ache" but no nausea or vomiting, and his appetite was poor. This persisted until the day previous to his admission, when he began to complain of pain in the right side. No nausea or vomiting developed. Pain persisted until the time of his admission. There was a questionable history of nocturnal perianal itching. The patient had fallen several years previously and suffered injury of several fractured ribs.

The patient was underdeveloped with adenoid facies. The heart and lungs were normal. There was abdominal tenderness over the right lower quadrant and localized rigidity in that area. The temperature, pulse and respiration were normal.

A blood count showed on admission 7,400 white cells; differential: polymorphonuclear leukocytes, segmented 42 per cent, nonsegmented 4 per cent; lymphocytes 52 per cent, basophils 1 per cent, eosinophils 1 per cent.

Operation was postponed because there was improvement in the patient's condition. A blood count the next morning showed 5,100,000 red cells, 8,350 white cells, with the following differential: polymorphonuclear leukocytes, segmented 40 per cent, nonsegmented 6 per cent; lymphocytes 48 per cent, eosinophils 5 per cent, basophils 1 per cent.

Analysis of the urine showed a faint trace of albumin and occasional leukocytes.

Because of recurrence of symptoms and abdominal manifestations the patient was operated on. The appendix was found

From the Warren General Hospital.

1. Lewis, Dean: Appendicitis in Children, in Cecil's Textbook of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1937, p. 766.

injected, 3 inches long, full and tense. It was freely movable. When the appendix was opened many live pinworms were found present.

Convalescence was uneventful. The patient was seen one month after discharge and was free from complaints.

In view of the presence of infestation in the family two of the remaining children were seen and blood counts were made. They were free of any complaint.

A blood count of M. T., aged 15, on February 13, showed 8,200 white cells; differential: polymorphonuclear leukocytes, segmented 51 per cent, nonsegmented 1 per cent; lymphocytes 46 per cent, eosinophils 2 per cent.

A blood count of N. T., aged 4 years, February 13, showed 8,350 white cells; differential: polymorphonuclear leukocytes, segmented 40 per cent, nonsegmented 6 per cent; lymphocytes 48 per cent, eosinophils 5 per cent, basophils 1 per cent.

Several weeks later the father was seen in the outpatient department with the complaint of vague abdominal pain. Examination gave negative results. Laboratory studies were also negative. He was seen the next day with similar complaints and reexamination gave no positive evidence of abnormality and he was sent home.

CONCLUSIONS

Several members of the same family suffered from Oxyuris infestation and acute appendicitis concomitantly.

Pinworm infestation should be considered in acute appendicitis in children. Eosinophilia with a suggestive history of perianal itching should be looked for.

2-12 Crescent Park West.

Special Clinical Article

NEW LIGHT ON THE MECHANISMS BY WHICH NERVOUSNESS CAUSES DISCOMFORT

CLINICAL LECTURE AT NEW YORK SESSION

WALTER C. ALVAREZ, M.D.

ROCHESTER, MINN.

One of the hardest jobs I have to do several times each day is to convince a patient with functional troubles that all the symptoms are due to a nervous interference with the functions of a normal heart and a normal digestive tract. Some of these persons will, of course, have noted that their troubles followed a nervous shock or a period of overwork, insomnia, anxiety or sorrow, and for them it will be easy to accept my diagnosis and my suggestion that they see first what the effects of reassurance and a rest will be; but others who have broken down nervously without obvious cause will be hard to convince. If to these persons I do not give plausible explanations for their symptoms, using simple speech and simple illustrations, and if I cannot patiently and convincingly answer all their objections, they will only move on to consult another physician.

Often also, while talking to the physician who referred the patient, I find it hard to get him to see how unlikely it is that the symptoms complained of could all be due to the ptosis, "colitis," low blood pressure, low blood sugar or low basal metabolic rate which he found. Unfortunately, little in the training that we physicians received in college and mighty little in the information that we have since found in books and articles has prepared us for the idea that the brain, all by itself, is commonly out of order and that disturbances in the nervous system can account for many of the syndromes that we see every day.

Obviously then the physician who wants to convince his colleagues and his patients of the functional and nervous nature of a number of common syndromes must not only make positive statements but be able to back them up with physiologic facts. Usually the patient, let us say a woman, denies that she is nervous, and commonly she is correct when she protests that she is intelligent, sensible and externally calm. She never was flighty or hysterical in her life, and she knows of no cause for a neurosis: she has a devoted husband, a happy home, ample means and nothing to worry about. Furthermore, as she says, how can her "storms" be of emotional origin when some of them come out of a clear sky, as when she is asleep or happy or perhaps on a vacation?

Symptoms Due to an Unstable Autonomic Nervous System.—Often, as I listen to the stories of these patients, it seems to me that their symptoms can most easily be explained as due to an instability of the autonomic or involuntary part of the nervous system which causes it to play disconcerting tricks on the heart, blood vessels, digestive tract, kidneys and skin. There will be attacks in which the patient will suffer with one or more of such symptoms as dizziness, faintness, trembling, jitteriness, chilliness, flashes of heat, flushing of the skin, sweating, waves of gooseflesh, palpitation, rapid or irregular heartbeat, air hunger, quivering in the abdomen, intestinal cramping, diarrhea, urticaria, bloating, frequent urination, perhaps a closing up of the nasal passages, and fear of impending disaster. Several of these symptoms are obviously those which would result from a stimulus spreading out through the sympathetic nerves and causing an outpouring of adrenin and sympathin. Others are due to stimulation of the parasympathetic nerves—the vagi and the sacral autonomics—and some are due to an outpouring of histamine, such as occurs in allergic persons.

If it is true, as physiologists now tell us, that there is a center in the brain which in health controls the autonomic nerves, the internal secretions and the involuntary organs so efficiently that we humans don't even know we have such things, then it would appear that in certain persons this center must function badly. But where is this center and why, at times, do storms come out of it?

HOMEOSTASIS AND THE HYPOTHALAMIC NUCLEI

Much of the answer we want can be found in the writings of Cannon,[1] who for years has been studying what he calls homeostasis, or the way in which the functionings of the several automatic organs of the body and the compositions of the several body fluids are kept within certain narrow limits. As he has shown, most of this vitally essential work is done by the sympathetic nervous system, which in turn is controlled by a sort of thermostat situated in the hypothalamic nuclei at the base of the brain. As Cushing once said, "Here in this well concealed spot . . . lies the very mainspring of primitive existence—vegetative, emotional and reproductive."

Here is the center that maintains body temperature by integrating the actions of the vasoconstrictors, the vasodilators, the sweat glands, the gooseflesh-making muscles, the somatic reflexes which bring about shiver-

From the Division of Medicine, the Mayo Clinic.

Read in the Medical Division of the General Scientific Meetings at the Ninety-First Annual Session of the American Medical Association, New York, June 11, 1940.

1. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear and Rage: An Account of Recent Researches into the Function of Emotional Excitement, ed. 2, New York, D. Appleton & Co., 1929.

ing and panting, and the mechanisms which regulate water metabolism and control urinary secretion. In addition, the hypothalamus has much to do with the deposition of fat, sexual development and the regulation of the breathing, the pulse rate, the cycle of sleep and waking, and the menstrual rhythm.

The Primitive Brain and Its New Control.—These are the functions we might expect this region to have when we remember that it represents the brain of those lowly ancestors of ours who crawled about in the mud millions of years ago, fighting for their food and their mates instinctively and without much will or choice. Gradually through the eons there developed those higher parts of the brain with which man now thinks and wills and remembers. In the normal adult these new higher parts keep the old lower ones under control, a control which was acquired partly during the ages and partly during the childhood of the individual. As every one knows, the small child behaves like an animal, snatching what doesn't belong to him, striking at his playmates, soiling himself, eating disgustingly and from time to time screaming with rage or fear. Only gradually does his cerebral cortex take over control as he learns to be more or less civilized. But even after he has become a gentleman, just let his cortex lose control, perhaps as he inhales some ether or after he drinks a pint of alcohol or gets into a rage, and again he may become a fighting beast. Or let the higher control be removed by a series of small strokes or by the widespread cortical degeneration that goes with senility or certain types of insanity, and again there may be left only a disgusting and irascible animal (Jackson,[2] Head[3]).

Storms That Come Out of the Uncontrolled Hypothalamus.—Interesting in this connection is the work of Cannon and Britton,[4] Bard[5] and others, who have shown that, if in an animal one removes the cerebral cortex so as to free from control the hypothalamus, the nuclei there will from time to time send out discharges which will cause the animal to go into attacks of cowering fear or of blind rage. Signs of great anger can be induced by merely touching the animal or picking it up, and they can be induced by stimulating the nuclei electrically. That this type of reaction can occur also in man was noted by Cushing in the case of a girl who had just had a glioma removed from the neighborhood of the hypothalamus. At the least touch she would become enraged.

At operations done on this region in men and women under local anesthesia the mere brushing away of blood may cause a maniacal reaction. Electrical stimulation of this region in conscious patients can produce a slowing of the heart, drowsiness, changes in blood pressure and respiratory rate, and feelings of anxiety. In animals such stimulation causes, besides the symptoms already mentioned, stoppage of the movements of the digestive tract.

The virus of the common type of encephalitis is particularly prone to attack the hypothalamic nuclei, and then some of the symptoms are somnolence and perhaps later insomnia, perhaps an agitated depression, difficulty in concentrating, attacks of anxiety, loss of appetite, fluctuations in weight, perhaps chilliness, air hunger, sweating, lacrimation and salivation and, in women, amenorrhea.

A Possible Explanation for Nervous Storms.—We have here, then, in all these observations, suggestions for the explanation of many of the disturbing symptoms which we physicians see every day. Obviously, of course, much is as yet theoretical, and no neurophysiologist would think of claiming that all the symptoms described can come out of only these particular centers in the hypothalamus. There are many other centers for emotional reactions, and activities in the cortex can also be associated with disturbances in the emotions and in the behavior of the autonomic nervous system. For instance, as a tense nervous student writes an examination paper perspiration may pour out of his right axilla and water may flow copiously from his kidneys.

It seems highly suggestive, however, that when through fatigue or disease the control which the cerebral cortex normally exerts over the hypothalamic centers is removed, or when these centers are affected by local disease, storms can go out along the autonomic nerves and homeostasis can be rendered so inefficient that the victim becomes painfully conscious of the workings of his formerly quiet organs. It is known today that even the amount of fatigue that follows the loss of a night's sleep or a little dissipation or a cold can so interfere with the prompt adjustments that an aviator's nervous system must make to the lowered supply of oxygen that is encountered at high altitudes that, for a day or two, he had better not take out his ship.[6]

As every physician knows, many of the patients whose centers for homeostasis are out of control and whose autonomic nerves are misbehaving have been through enough strain, overwork or sorrow to tire the brain severely, and as C. M. Child has shown repeatedly, under adverse influences it is the higher centers that suffer first and to the greatest extent. In the badly fatigued person, then, it may be that the jitteriness, the increase in irritability, the insomnia and the tendency to flare up angrily or to worry pathologically are due largely to the escape from control of hypothalamic centers.

Equivalents of Insanity.—When the curious autonomic storms come in a person who has not been under any obvious strain I always think first of the possibility that some hereditary nervous taint which in other members of the family has produced insanity or epilepsy has in this person injured the centers that keep the involuntary nerves working smoothly and quietly. Actually one has only to study the members of a few families blighted by mental disease to find several persons with these queer stormy syndromes which are not described in textbooks and are therefore not well understood by the medical profession.

A Relation Between Nervous and Endocrine Diseases.—Another thing that through the years has impressed me about families with a nervous taint is that while some of the members have nervous troubles others have endocrine disturbances with perhaps poor sexual development, and others have curious mixtures of nervous and endocrine deficiencies. To me this is understandable now that it is known that injury to a

2. Jackson, J. H.: The Croonian Lectures on Evolution and Dissolution of the Nervous System, Brit. M. J. **1**: 591-593 (March 29), 660-663 (April 5), 703-707 (April 12) 1884.

3. Head, Henry: Croonian Lecture: Release of Function in the Nervous System, Proc. Roy. Soc., London, s. B. **92**: 184-209 (June) 1921.

4. Cannon, W. B., and Britton, S. W.: Studies of the Conditions of Activity in Endocrine Glands: XV. Pseudaffective Medulliadrenal Secretion, Am. J. Physiol. **72**: 283-294 (April) 1925.

5. Bard, Philip, and Rioch, D. McK.: A Study of Four Cats Deprived of Neocortex and Additional Portions of the Forebrain, Bull. Johns Hopkins Hosp. **60**: 73-147 (Feb.) 1937.

6. Cannon, W. B.: Stresses and Strains of Homeostasis, Am. J. M. Sc. **189**: 1-14 (Jan.) 1935.

part of the brain, the hypothalamus, through its influence on the pituitary gland, can produce a fat sexless boy or a hairy girl who does not menstruate properly. As Foster Kennedy has said, formerly one wondered if a certain girl's failure to menstruate properly produced her psychopathy, but now it is obvious that all her troubles can come from one injury, and that to her brain. One can now see also why, in many of these cases, no amount of treatment with desiccated glands helps.

Encephalitis.—As I have already noted, the virus of encephalitis has a tendency to attack the centers in the hypothalamus, and for years I have suspected that mild infections of this type are responsible for some of the nervous breakdowns for which there is no discoverable cause, for some of the states in which the patient feels toxic and without his usual sense of well-being, and for some of the syndromes characterized by nervous storms. This idea is not so improbable now that it is known that many animals carry latent in the brain an encephalitic virus, and that many human beings carry the related herpetic virus. In these persons the least infection that lowers resistance will bring the blisters out around the mouth.

To me it is suggestive that injury wrought in the hypothalamic nuclei by a virus tends to produce either somnolence or insomnia and that these nuclei are particularly subject to depression by the barbiturate derivatives which are used so much today for the production of sleep. It is probably more than a coincidence that it is just the psychopathic or markedly fatigued person whose nerves are playing tricks on him who does not respond well to the barbiturates; in him they often produce only an unpleasant form of stimulation. Perhaps this indicates again that in these persons there is something wrong with the hypothalamic centers. Perhaps also there is a connection between this something wrong and the insomnia that so many of the patients with nervous storms complain about. Curiously, morphine often has an excitant effect on these persons similar to that which is seen regularly in cats, and now W. E. Hambourger has found that this peculiar effect comes out of the hypothalamus.

Small Intracranial Thromboses.—In older men and women another conceivable cause for an upset in the functions of the hypothalamic nuclei is injury wrought by one or more of those small thromboses that develop so commonly in cases of intracranial arteriosclerosis. Whenever in an older person a nervous breakdown comes suddenly with curious storms and a loss of all joy in life, one must strongly suspect a vascular injury to the brain. Unfortunately, few physicians think of this when, as so commonly happens, there is no weakening of arm or leg.

A Laboratory Test for a Defect in Homeostasis.—Interestingly, one can easily detect a failure in homeostasis, and one can sometimes recognize the type of person who is likely to have nervous storms, simply by comparing the results of tests made on the first day of an examination, when the patient was excited and worried, with the results of the same tests made later when the patient was mentally relaxed. Often as I have protested against the modern tendency of physicians to make diagnoses purely on the basis of laboratory reports, I have said that there is no laboratory test that will show that the patient has a psychosis, an unhappy love affair or a domineering mother-in-law, but to some extent I was wrong because often I recognize a nervously unstable patient from a glance at the record of the examination. If I find that on two days the figures for blood pressure, temperature, basal metabolic rate, pulse rate, leukocyte count and blood sugar were practically the same I assume that the patient is fairly stable, but if I find that on the first day the figures were all abnormally high and on the next day they were normal, I am fairly certain that I am dealing with a somewhat unstable and apprehensive person.[7]

THE HORMONAL THEORY OF NERVOUS TRANSMISSION

So much for an explanation of the way in which storms can arise in the hypothalamus to plague and torment a tired or nervous or psychoneurotic or menopausal person. Now let us look at some other recent advances in physiologic knowledge which throw light on the mode of production of the symptoms after the storm starts. I refer to the recently discovered fact that, when one stimulates autonomic nerves, powerful drugs are set free at their endings, drugs which produce the observed effects on heart, intestine, blood vessels and skin.

Out of the vagal and sacral autonomic endings comes acetylcholine, which slows the heart, dilates the blood vessels and causes sweating, and out of most of the sympathetic nerve endings and out of the adrenal medulla comes adrenin, which makes the heart palpitate and sends up the blood pressure. The structures which are brought into action by the sympathetic impulses elaborate sympathin, which, in some of its actions, resembles adrenin. Other nervous influences cause outpourings of histamine, which appears now to be responsible for many of the symptoms of allergy. Interestingly, it has been shown in normal students that the injection of acetylcholine will cause changes in the mucosa of the bowel similar to those of the so-called mucous colitis which plagues most nervous women.

To me these facts are most useful because with them I can bolster up the self respect of the woman whose nerves are playing unpleasant tricks on her and frightening her badly. No longer need she feel on the defensive when her physician tells her that no organic disease can be found to explain her miseries. There can be no question now about the fact that her symptoms are real and just as disturbing and alarming as those that might follow if a physician were to inject into her veins a big dose of acetylcholine or adrenin or any other powerful drug. No one can blame her for being distressed and frightened, and no well informed person should ever think of telling her to forget it or to snap out of it. As I say to such a woman, "If I were to put a pint of whisky into you by stomach tube, no one could blame you for getting drunk, and you would have no reason for being ashamed of your behavior."

Probably luckily for us, acetylcholine is destroyed in the body almost as fast as it is formed, but unfortunately this is not true of the other hormonal substances. In ages past when a man became excited and his life depended on his ability to strike down an enemy or to beat him in a foot race, the outpouring of adrenin was useful because it helped the muscles to contract, and it delayed the coming of fatigue. During the ensuing fight or flight the adrenin was burned up, and hence it didn't stay in the man to plague him. The

7. The literature on this defect in homeostasis in the psychoneurotic is well reviewed in pages 623 to 626 of Bodansky, Meyer, and Bodansky, Oscar: Biochemistry of Disease, New York, Macmillan Company, 1940.

trouble today is that when persons get angry or frightened they commonly sit still and fight only with words or thoughts, and the powerful chemical hormones set free are only slowly destroyed. Perhaps now we have an explanation for the fact that exercise and physical work will often steady nervous persons and make them feel well. In women at the menopause exercise may temporarily put a stop to the flashes, perhaps by burning up the hormones that from time to time are being liberated in the body because of a poorly adjusted "thermostat."

SUMMARY

The physician's hardest job often is to convince a patient with functional troubles that all his symptoms are due to the misbehavior of nerves connected with a tired brain. The physician who expects to convince such a patient and to stop him from going the rounds of consultants' offices must have good and scientific explanations for the symptoms.

Most of the symptoms of these persons suggest an instability of the involuntary nervous system which causes it to play disconcerting tricks on a normal heart, blood vessels, digestive tract, kidneys and skin. The symptoms suggest storms running out along the autonomic nerves.

In the normal person there is a sort of thermostat situated in the hypothalamic nuclei at the base of the brain which controls the involuntary nerves and the glands of internal secretion so perfectly that the organs of the body function silently: so silently that the owner is unconscious of them. Normally this "thermostatic center" is kept in control by the cerebral cortex. When this control is removed in any way, the center works erratically, and storms go out to cause upsets in the functions of many of the organs of the body.

The "thermostatic center" can be upset by fatigue, insomnia and nervous strain. In many persons it behaves erratically because of a bad nervous inheritance, an inheritance that may have produced insanity, equivalents of insanity or abnormalities in sexual development in other members of the family. The center may be injured also by an encephalitic virus or in older persons by little thromboses due to arteriosclerosis.

When the storms come out of the brain along the involuntary nerves, at the ends of these nerves are formed powerful chemical substances which have disturbing effects on most of the organs of the body. This means that the patient need not feel embarrassed about telling of his symptoms. When the storm comes and the powerful hormones are injected into him by his nervous system, he can no more avoid having alarming symptoms than he could avoid getting drunk if some one were to force a pint of whisky down his throat.[8]

8. An introduction to the literature on this subject in addition to those already cited can be obtained from the following books and papers:

The Interrelationship of Mind and Body (printed for the Association for Research in Nervous and Mental Disease), Baltimore, Williams & Wilkins Company, 1939, vol. 21.

The Hypothalamus and Central Levels of Autonomic Function (printed for the Association for Research in Nervous and Mental Disease), Baltimore, Williams & Wilkins Company, 1940, vol. 20.

Alvarez, W. C.: The Use of Barbituric Acid Derivatives to Differentiate a Certain Type of Neurotic Temperament, in Emanuel Libman Anniversary Volumes, New York, International Press, 1932, vol. 1, pp. 51-54.

Cannon, W. B.: The Wisdom of the Body, ed. 2, New York, W. W. Norton, 1939.

Cannon, W. B., and Rosenblueth, Arturo: Autonomic Neuro-Effector Systems, New York, Macmillan Company, 1937.

Newman, H. W.: Chemical Transmission of Nervous Impulses, Am. J. M. Sc. **198**: 857-861 (Dec.) 1939.

Pearson, E. F.: Application of New Knowledge of Nerve Physiology to Clinical Medicine, Illinois M. J. **75**: 227-231 (March) 1939.

Rosenblueth, Arturo: The Autonomic Nervous System, in Luck, J. M., and Hall, V. E.: Annual Review of Physiology, Stanford University, Calif., Annual Reviews, Inc., 1940, vol. 2, pp. 263-286.

Special Article

THE PHARMACOPEIA AND THE PHYSICIAN

LEUKORRHEA

CLINICAL AND THERAPEUTIC ASPECTS

P. BROOKE BLAND, M.D.
AND
ABRAHAM E. RAKOFF, M.D.
PHILADELPHIA

This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Basically, leukorrhea is a symptom, not a disease. Subjectively and objectively it is an expression of some underlying disorder, either functional or organic. Though the symptom may arise from a variety of constitutional or systemic conditions, it has its origin, in most instances, in some lesion of the reproductive organs. The symptom may appear at any age, as in infancy, in childhood, in the child bearing period, in the menopausal years and during senescence.

Although leukorrhea may be an accompaniment of many local and systemic diseases, it is a predominant symptom in a particular group of diseases. It must always be borne in mind, however, that leukorrhea may be the symptom which, if properly investigated, will lead to the discovery of more serious lesions, such as neoplasms, syphilis, tuberculosis and a host of other diseases.

The treatment of leukorrhea is no longer palliative but rather therapy is directed at specific disease entities. This change has been brought about by a better understanding of the various endocrine factors which control the biologic characteristics of the vagina and cervix, plus a better appreciation of the significance of various organisms present in the lower genital tract. It is now well established that the cyclic proliferation of the vaginal epithelium and the deposition of glycogen in its cells are under the direct control of ovarian estrogenic activity and that these factors in turn influence the p_H of the vaginal secretion and its flora.

Thus, in arriving at an etiologic diagnosis in a case presenting an increased vaginal discharge, one or more of the following procedures are usually required:

1. Fresh wet smear examination of the vaginal and cervical discharge. Dark field examinations are sometimes necessary.
2. Gram-stained smears. Occasionally special stains may be required.
3. Routine or special cultures.
4. Evaluation of the cellular content by smear methods as an indicator of estrogenic activity. Biopsy may also be employed.
5. Determination of the p_H of the vaginal and cervical secretions, either with indicator papers or, preferably, with a p_H meter.
6. Biopsy for histologic diagnosis.

CERVICAL INFECTIONS

Infections of the cervix constitute a common cause of leukorrhea. The deep-branching glands of this structure form an excellent nidus for various bacteria, which may gain entrance to the genital tract and result in deep-

seated chronic infections, of which persistent leukorrhea is a prominent symptom. Cervical infections may result from primary invasion with a specific organism, notably the gonococcus, or may be caused by invasion of a variety of organisms following postpartum, postabortal or instrumental trauma.

Acute Stage.—In the acute stage of cervical infections the treatment of the accompanying leukorrhea is overshadowed by efforts to prevent the extension of the infection to the uterine cavity and the structures beyond, either by direct extension or through the lymphatics.

The treatment is entirely along medical lines and is directed toward the rest of the infected tissues, local cleanliness and the establishment of proper drainage.

Vulvar irrigations ("pitcher douches") three or four times a day afford much relief and are of hygienic aid. A saturated solution of boric acid or compound solution of iodine, 1 drachm (4 cc.) to 2 quarts (liters) of warm water, may be used for this purpose.

If the discharge is especially malodorous, glycerin suppositories containing 0.5 per cent zinc sulfate may be gently inserted into the vagina as needed. In cases of acute cervical gonorrhea the use of suppositories, or any intravaginal medication, is usually best omitted.

Sulfonamide compounds have yielded good results and have greatly reduced the time required for the treatment of acute gonorrhea. When these chemotherapeutic agents are employed, adequate facilities should be available for observing the condition of the blood before and during the course of therapy. The patient must be carefully followed by smear and culture methods for evidence of relapse, since the rapidity with which an apparent cure may be obtained often imparts a false sense of security.

Artificial fever therapy also yields a goodly percentage of early cures in cases of acute gonorrhea, but the tendency at present is to reserve this mode of therapy for "sulfanilamide failures."[1]

Chronic Stage.—In chronic cervical infections a variety of methods of treatment are available, depending on the degree of the pathologic changes and the familiarity with the various methods.

The aim in treatment is the destruction of the infected glands, the establishment of free drainage and the restoration of the normal anatomic contour and histologic structure of the cervix.

Topical applications of antiseptics and caustics to the cervix are of limited usefulness except when the infection is superficial. Before applying these, the cervical canal and lips are first thoroughly cleansed with sodium bicarbonate solution (25 per cent). If the mucous plug is tenacious, it may be dissolved by the careful application of sodium hydroxide (10 per cent), or it may be coagulated with silver nitrate (10 per cent) and then removed. For painting the diseased area silver nitrate (from 10 to 25 per cent) has long been employed. The excess is removed with saline solution and the vaginal membrane protected with a tampon saturated with boroglycerin. This treatment is repeated once or twice a week until the structure returns to normal.

In the majority of cases the mechanical destruction of the infected area by the actual cautery is far more effective and whenever possible should be used in cases dependent on endocervical infection. In cases of a superficial nature the broad cautery blade at "dark red heat" should simply sear or char the inflammatory area. With the inflammatory process extending into the deep cervical tissues with involvement and dilatation of the glands (cystic formation), cauterization should be more thorough and the affected glands themselves should be destroyed. The same result may be achieved with Hyams's conization method.

If active infection with a virulent organism is still present, spread of the infection may follow electrocoagulation and cauterization, especially if this is inefficiently done.

In chronic gonococcic infection a course of sulfanilamide therapy preceding cauterization has been recommended.

NONSPECIFIC VAGINITIS

In long-standing cervical infections, the continuous lowering of the vaginal acidity with the profuse alkaline cervical discharge may result in the displacement of the normal vaginal flora, which usually consists of gram-positive lactobacilli (Döderlein's bacilli), by a variety of other organisms. Not infrequently this results in a low grade nonspecific vaginitis. The prolonged use of irritating chemical douches, persistent trauma, or long-standing vaginal hypo-acidity may also produce this condition.

PRESCRIPTION 1.—*Acid Vaginal Douche*

		Gm. or Cc.
℞	Chlorthymol	1.3
	Menthol	2.0
	Methyl salicylate	2.0
	Lactic acid in sufficient quantity.....to make	180.0

Mix and label: A teaspoon in 2 quarts of hot water, to be used as a vaginal douche morning and evening.

The underlying etiologic factor should be determined and corrected. The associated leukorrhea may be controlled and the return of the normal flora hastened by the use of acid vaginal douches (prescription 1) twice daily.

Ordinary vinegar, 1 tablespoon to 2 quarts of water, as recommended by Karnaky,[2] may also be employed.

PRESCRIPTION 2.—*Acid Vaginal Jelly*

		Per Cent
℞	Lactose	6.000
	Citric acid	0.275
	Tragacanth	1.73
	Irish moss	1.75
	Glycerin	22.58
	Boric acid	2.00
	Water .....to make	100.00

More recently we have also employed an acid vaginal jelly, adjusted to p_H 4.0 (prescription 2), 5 cc. of which is introduced with a vaginal applicator before retiring.

VAGINAL TRICHOMONIASIS

That trichomonad infection is one of the most common causes of leukorrhea is attested by the observation that a large percentage of gynecologic and obstetric patients encountered in routine practice suffer with this type of infection, which is almost always accompanied by an abnormal vaginal discharge.

1. Jones, Nathaniel; O'Hara, G. P., and Warren, S. L.: Fever Therapy for the Treatment of Gonococcal Infections in "Sulfanilamide Failures," Tr. Am. Neisserian M. Soc., 5th annual meeting, 1939, pp. 150-160.

2. Karnaky, K. J.: Normal Physiologic Douches, South. M. J. 30: 69-70 (Jan.) 1937.

The number, however, seeking treatment for the condition is dependent not simply on the presence of the parasite in the vaginal secretion but also on the social status and personal habits of the individual. The severity of the symptoms is also dependent on the accompanying bacterial invaders.

It must be acknowledged, regretfully, that a specific method of prophylaxis is as yet not forthcoming, since the medium of transmission of the disease is not completely known.

The majority of infections probably occur as the result of contamination with moist vaginal secretion of infected patients.[3] It is possible that a small number of patients become infected by sexual contact, since it has been demonstrated that trichomonads are present —usually in small numbers—in the urethra or prostate of from 5 to 10 per cent of men.[4]

Prophylactically, a mild antiseptic douche, immediately following the exposure to contamination, such as bathing in still water pools, contact with contaminated tubs, toilet seats or linens, or sexual congress, may provide a reasonably safe means of protection.

With regard to active treatment, it may be said that almost any local cleansing measure will afford temporary symptomatic relief, but recurrence is almost certain to ensue unless treatment directed to destroy all the flagellates is diligently practiced and continued until the genital tract remains parasite free through at least three or four menstrual periods.

Here it may be pertinent to emphasize that, although trichomonads are easily destroyed by drying and weak antiseptics, a few survivors not reached in the vulvovaginal folds, the urethra or the cervix will rapidly multiply and in the course of from twenty-four to forty-eight hours provoke symptoms of an active nature. Therefore it is not only desirable but essential that the first three or four treatments be administered at daily intervals. These initial treatments must come in contact with every part of the lower genital canal and hence should be conducted by the physician rather than by the patient herself.

Technically, the steps of the local treatment which we carry out may be described as follows:

1. Thorough exposure and cleansing of the cervix, vagina and external genitals are essential. For this purpose, tincture of green soap, diluted twenty times with warm water, or a saturated solution of sodium perborate may be used. The latter has the advantage of effervescing when in contact with the tissues, thus aiding in the cleansing process. On the other hand, burns have occasionally been reported with the use of sodium perborate.

2. Any organisms within the cervical canal are destroyed by carrying an applicator dipped in a strong antiseptic solution, such as tincture of iodine, well into the structure.

3. The entire vaginal tract is thoroughly dried with soft cotton pledgets or with a stream of warm air, following which the speculum may be removed.

4. A nonirritating aqueous antiseptic, such as acriflavine 1:1,000, is introduced into the urethra with a medicine dropper. The introitus and external genitalia are then thoroughly dried with cotton or warm air.

5. Following the drying process an effective trichomonadicidal agent is applied to the vulvovaginal tract. The use of antiseptic powders in a drying base have been found especially effectual. Powders of this character may be insufflated by a vaginal powder blower.

A fine grade of kaolin is usually employed as a drying base and, in some instances, this alone may overcome the disorder. It is usually necessary to combine the kaolin with a protozoacide. The pentavalent arsenicals, such as acetarsone and carbarsone, are frequently used. Sodium bicarbonate may be added to these preparations to increase their solubility (prescription 3).

PRESCRIPTION 3.—*Vaginal Powder with Protozoacide*

℞	Acetarsone or carbarsone	1 part
	Sodium bicarbonate	1 part
	Kaolin ..... to make	6 parts

Mix and label: 5 Gm. to be insufflated into the vagina by the physician.

Silver picrate, 1 per cent, in kaolin is also highly recommended.

A less expensive powder, which we have found useful, is given in prescription 4.

PRESCRIPTION 4.—*Vaginal Powder with Zinc Sulfate*

		Gm.
℞	Zinc sulfate	0.5
	Boric acid	50.0
	Kaolin ..... to make	100.0

Mix and label: 5 Gm. to be insufflated into the vagina by the physician.

The addition of lactose to these powders has been recommended by some workers to aid in the reestablishment of a normal flora of Döderlein's bacilli.

6. The foregoing treatment should be repeated daily for three successive days and then at intervals of three days until at least six treatments have been given.

7. Following the three initial treatments it is advantageous to have the patient employ a cleansing acid douche (prescription 1). From 2 to 4 quarts of the solution at 105 F. should be used.

8. It is often necessary to continue daily vaginal douches during the menstrual period, since, as is well known, many recurrences follow immediately or shortly after menstruation.

9. Vaginal suppositories medicated with various trichomonadicides are frequently used, but as a rule they simply control rather than overcome the infection. They are recommended as therapeutic adjuvants but not as curative agents.

10. The marital relation should not be practiced during the course of active therapy. Recurrence following coition calls for an examination of the husband to determine whether he is or is not harboring the parasite in the urethra or prostate.

11. After an initial course of treatment all local measures may be discontinued for several days, and the vaginal secretion during this time should be examined for the presence of trichomonads. No patient should be considered cured until she has passed through three or four menstrual periods wholly free from the organisms.

12. In resistant cases it is often necessary to treat the patient every second or third day through two or

3. Bland, P. B., and Rakoff, A. E.: The Incidence of Trichomonads in the Vagina, Mouth and Rectum; Evidence that Vaginal Trichomonads Do Not Originate in Mouth or Intestine, J. A. M. A. **108**: 2013-2016 (June 12) 1937.

4. Riba, L. W.: Trichomonas Urethritis, J. A. M. A. **96**: 2100-2102 (June 6) 1931. Ackermann, Armin: Die Trichomonas vaginalis Infektion, Dermat. Ztschr. **71**: 132-157 (May) 1935. Bland, P. B., and Rakoff, A. E.: Trichomonas Vaginitis, in Cyclopedia of Medicine, Philadelphia, F. A. Davis Company, vol. 13, 1937.

three menstrual cycles. In such instances one must carefully guard against cumulative toxic effects from the prolonged use of arsenicals, silver salts, picrates and the like. It is sometimes advisable to alternate treatment with several trichomonadicidal agents.

13. In pregnancy active treatment may be indicated because of the severity of the symptoms or the "unhealthy" character of the vaginal secretion. In such instances it is best to begin treatment as early as possible, and under no circumstances should intravaginal treatment be continued beyond the thirty-sixth week of gestation.

Local treatment should be given with the utmost gentleness. The powder is insufflated without appreciably increasing the intravaginal pressure. The number of douches are reduced to a minimum and are given at very low pressure, without a nozzle.

MONILIASIS

The increase in glycogen and vaginal acidity which occurs during gestation favors the growth of Monilia and related yeastlike fungi. Vaginal moniliasis is therefore found far more commonly in pregnant women, in whom it is associated with thick, white, "cheesy" thrush patches encrusted on the vaginal walls and accompanied by considerable inflammation and edema of the vulva with marked pruritus.

In the treatment of moniliasis three objectives should be kept in view: first, prompt relief of the intense pruritus; second, destruction of the causative organisms, and, third, prevention of the spread of the infection to other surfaces, such as the surrounding glabrous skin or nipples or to the newborn, in whom it may cause oral thrush by contamination at the time of delivery.[5]

These objectives may be obtained by first swabbing the entire lower genital tract and vaginal canal every second day with sodium bicarbonate (5 per cent) until all secretions and thrush patches are removed and then thoroughly painting the structures mentioned with an aqueous solution of gentian violet or a solution of gentian violet plus acriflavine (prescription 5).

PRESCRIPTION 5.—*Solution of Gentian Violet and Acriflavine*

℞	Gentian violet, 1 per cent aqueous solution	1 part
	Acriflavine, 0.1 per cent aqueous solution	1 part

Mix and label: Apply locally.

This solution does not stain as intensely and appears to be equally effective.

The solution is dried with a current of air from a hair drier or Sorenson pump while the speculum is still in situ. Although the relief afforded by the application of these solutions is prompt, they are objectionable to some patients because of staining of the bed linen and wearing apparel as they drain from the vaginal canal.

While gentian violet inhibits the growth of Monilia, its actual killing power is low. For this reason Hesseltine [6] and other observers advocate the use of some form of iodine as a more potent fungicide.

Compound solution of iodine, diluted from five to ten times with water, may be used to paint these structures instead of aniline dyes, though it is worthy of mention that symptomatic relief will not be so promptly provided.

Starting twenty-four hours after the topical application is made by the physician, the patient is instructed to use an alkaline douche (prescription 6) morning and evening.

If the vulvar skin has become infected with the fungus, more persistent treatment is necessary. In addition to treating the vaginal infection, the cutaneous lesions must be diligently cared for by the application of gentian violet in alcoholic solution (5 per cent) or tincture of iodine (2 per cent).

PRESCRIPTION 6.—*Alkaline Douche*

		Gm.
℞	Zinc sulfate	12.0
	Menthol	2.0
	Camphor	2.0
	Sodium bicarbonate	90.0
	Sodium borate	90.0

Mix and label: A teaspoon in 2 parts of warm water to be used as a douche on retiring.

PRESCRIPTION 7.—*Fungicidal Ointment*

		Gm.
℞	Ammoniated mercury	1.6
	Salicylic acid	2.0
	Wool fat	12.0
	Petrolatum to make	60.0

Mix and label: To be applied to the parts affected two or three times daily.

Fungicidal ointments, as recommended by Wise and Wolf,[7] are useful in resistant cases (prescription 7).

FUSOSPIRILLOSIS AND RELATED INFECTIONS

Vaginal infections due to Vincent's organisms or various types of Spirillum and Spirochaeta are usually associated with and favored by uncleanliness. They may result from abnormal sexual practices or from autoinoculation from the mouth of women suffering with infection of the "gums." As a secondary infection it may become superimposed on other ulcerative lesions, especially those of a granulomatous character.

In cases of fusospirillosis the discharge is profuse, thick, yellow and purulent. The morbid changes in the vaginal mucosa may be pronounced. The membrane is injected and raw and presents a "raw beef" appearance. In some instances rather deep ulcerations may occur.

An infection clinically identical and probably acquired in the same way may be caused by other types of Spirillum and Spirochaeta [8] of low grade pathogenicity such as are frequently found in the mouth. The organisms may be demonstrated by dark field examination or in smears stained with Giemsa's spirochetal stain.

Treatment.—These infections usually respond rapidly to simple local cleansing measures unless there is another underlying cause present. An effective means of therapy is as follows:

1. The entire lower genital tract is thoroughly swabbed with a saturated solution of sodium perborate,

5. Hesseltine, H. C.; Borts, I. C., and Plass, E. D.: Pathogenicity of the Monilia (Castellani), Vaginitis and Oral Thrush, Am. J. Obst. & Gynec. **27**: 112-116 (Jan.) 1934. Bland, P. B.; Rakoff, A. E., and Pincus, I. J.: Experimental Vaginal and Cutaneous Moniliasis, Arch. Dermat. & Syph. **36**: 760-780 (Oct.) 1937.

6. Hesseltine, H. C.: Experimental and Clinical Therapy of Vulvovaginal Mycoses, Am. J. Obst. & Gynec. **34**: 439 (Sept.) 1937.

7. Wise, Fred, and Wolf, Jack: The Pharmacopeia and The Physician: Use of Dermal Parasiticides, J. A. M. A. **107**: 1126-1132 (Oct. 3) 1936.

8. Allen, E. A.: Diagnosis and Treatment of Persistent Vaginal Discharge, M. Clin. North America **21**: 307-318 (Jan.) 1937.

which should be employed with care, since it occasionally may lead to burns of the mucous membrane.

2. An arsenical drying powder, such as that described in the treatment of trichomonas vaginitis, is insufflated into the vagina. This is repeated two or three times a week.

3. The patient is instructed to use the vaginal douche given in prescription 8 twice daily.

PRESCRIPTION 8.—*Methyl Salicylate and Sodium Perborate Douche*

		Gm.
℞	Methyl salicylate	2.0
	Sodium perborate	120.0

Mix and label: Two teaspoons in 2 quarts of warm water to be used as a vaginal douche morning and evening.

The thorough and frequent daily application of neoarsphenamine, 10 per cent, in glycerin to the entire genital tract is also very effective.

LEUKORRHEA IN CHILDREN

Because of the delicate nature of the epithelial lining of the vagina, together with the neutral or alkaline reaction of its secretion, the canal itself in little girls is especially susceptible to bacterial invasion.

Infections of the vagina may be due to a specific pathogen, particularly the gonococcus, or they may be "nonspecific," caused by a variety of organisms. The introduction of foreign bodies into the vagina frequently gives rise to the latter type of infection.

Treatment.—The first essential in the treatment of gonorrheal vaginitis in children is, of course, strict isolation in order to prevent contamination of the other children in the household or institution.

Numerous therapeutic measures have been recommended and practiced in the treatment of this type of infection, though until recently none were really wholly dependable or satisfactory.

The methods one may employ may be thus enumerated:

1. Local Application of Antiseptics: Antiseptics may be effectively introduced into the vagina in the form of a water-soluble jelly. The formula suggested by Reichert[9] has proved very satisfactory: "To 2 drachms [8 Gm.] of tragacanth ribbon is added 8 ounces [240 cc.] of an aqueous solution of the antiseptic to be used and 4 grains [0.26 Gm.] of sodium benzoate. The mixture is allowed to swell and is then expressed through cloth." Silver nitrate (from 0.5 to 1 per cent), strong protein silver (2 per cent) and various other antiseptics may be used for this purpose.

The jelly is warmed to body temperature before use and from 5 to 10 cc. is introduced into the vagina through a soft rubber catheter attached to a 10 cc. syringe.

A small, snugly fitting pad is applied and the child kept in the dorsal position for ten minutes to permit the jelly to harden.

Treatment should be repeated every two to three days and, in resistant cases, daily.

Although with persistent treatment good results may be obtained in many cases with this form of treatment, the results are not as good, as regards either promptness of cure or percentage of relapses, as are obtained with estrogen suppositories.

2. Estrogenic Hormones: Treatment with estrogens, first suggested by Lewis,[10] is now accepted as a notable advance in the treatment of gonococcic vulvovaginitis.

Although the hormone may be effectively administered in a number of forms, the use of suppositories has proved to be the most convenient route and is accompanied by fewer undesirable estrogenic effects.

A satisfactory technic which may be employed is as follows:

(*a*) The mother of the child is instructed simply to cleanse the vulva with soap and water.

(*b*) A small vaginal suppository, containing from 500 to 1,000 international units of an estrogenic hormone is gently introduced into the vaginal canal at bedtime. In the majority of instances the mother may be taught to do this.

In from four to ten days a favorable response is generally noted in the vaginal smears, since large squamous epithelial cells replace the leukocytes and smaller cells as cornification occurs. The vaginal secretion becomes white and flaky and markedly acid in reaction. In this environment the gonococcus disappears.

It is generally necessary to continue treatment for four weeks, and when the response is not so prompt this may be extended to six weeks.

Repeated negative smears at weekly intervals for a period of from three to four months after treatment has been discontinued are necessary before the child can be considered cured.

If evidence of other estrogenic effects are noted, such as enlargement of the breasts, uterine bleeding, hypertrophy of the labia and growth of pubic hair, the hormone should be withdrawn and replaced with another form of treatment.

In resistant cases, or in cases in which repeated relapses occur, the cervix should be inspected with a vaginoscope or cystoscope for evidence of infection, and smears and cultures taken from this structure. The rectum should also be examined for evidence of infection. There is considerable difference of opinion as to how frequently these structures serve as foci of reinfection.

Exceptionally good results are obtained in the treatment of "nonspecific" infection with estrogen therapy. Care must be observed, however, to eliminate first the presence of an underlying factor, especially the removal of any foreign bodies.

3. Sulfanilamide: Further investigation is required before the place of sulfanilamide and its related compounds can be established in the treatment of gonococcic vulvovaginitis.

In properly chosen cases, treatment of gonococcic vulvovaginitis with sulfanilamide has given fairly good results. It is not to be recommended as a routine procedure and is perhaps most judiciously employed when other methods of treatment fail.

The treatment of gonococcic vulvovaginitis with sulfanilamide necessitates hospitalization, since careful observation, including blood counts and blood sulfanilamide levels, are of the utmost importance.

The dosage that should be employed has not yet been established to the satisfaction of all workers. A dose of three-fourths grain (0.05 Gm.) per pound

9. Reichert, J. L.; Epstein, I. M.; Jung, Ruth, and Colwell, Charlotte A.: Infection of the Lower Part of Genital Tract in Girls, Am. J. Dis. Child. **54**: 459-495 (Sept.) 1937.

10. Lewis, R. M.: A Study of the Effects of Theelin on Gonorrheal Vaginitis in Children, Am. J. Obst. & Gynec. **26**: 593-599 (Oct.) 1933.

(450 Gm.) of body weight is frequently recommended at the onset. This may be given in four divided doses with an equal amount of sodium bicarbonate for the first two days. The dose may then be reduced to one-half grain (0.032 Gm.) per pound of body weight for from two to three weeks, depending on the rapidity with which the smears become negative.

Smears must be rechecked at frequent intervals.

As Schauffler and his associates [11] and Benson [12] have pointed out in the reviews of the subject, the percentage of cures obtained by different workers has varied greatly. This has been attributed in part to ineffective dosage, although Benson states that there appears to be little relation between the amount of sulfanilamide given and the result of treatment.

LEUKORRHEA OF ENDOCRINE ORIGIN

Hyperestrogenism.—In newborn infants there is frequently present a profuse, white and flaky discharge which persists from several days to two weeks. This results from the desquamation of the vaginal epithelium, which has been overstimulated by the high blood estrogen obtained through the maternal circulation.

The moderate increase in vaginal discharge which is a physiologic accompaniment of pregnancy may be attributed to the same cause.

A similar type of noninfective leukorrhea is sometimes seen in nonpregnant women, especially young women.[13] This is usually worse in the latter half of the menstrual cycle and is subject to periods of remission and exacerbation. Pruritus is frequently an accompanying symptom.

The discharge resembles the normal secretion in character and is highly acid (usually p_H 3.9 to 4.2). Stained smears usually reveal large cornified epithelial cells and the vaginal bacilli of Döderlein.

This type of leukorrhea is exceedingly difficult to treat. Progesterone from 2 to 5 mg. two times a week in the last two weeks of the cycle sometimes yields good results, while in other instances it may have little or no beneficial effect. An alkaline antipruritic douche (prescription 6) is of palliative value.

A similar type of discharge may develop during the period in which large doses of estrogens are being administered for other purposes.

Hypo-Estrogenism.—Atrophic changes in the vaginal epithelium are frequently seen in the postmenopausal period. Nonspecific infection with a variety of organisms often occurs and results in a purulent discharge. Pruritus is also a prominent symptom. If untreated, ulcerations and adhesions of the vaginal membranes may result.

For this condition estrogen is a specific therapeutic agent. This may be given parenterally or, preferably, in the form of large vaginal suppositories. In the beginning, one suppository, containing from 2,000 to 10,000 international units of estrone or estradiol, may be inserted nightly. After vaginal cornification occurs this is reduced to the minimum amount that will afford relief of symptoms and maintain the vaginal membrane in a healthy state.

1621 Spruce Street—2126 Spruce Street.

11. Schauffler, G. C.; Kanzler, Reinhold, and Schauffler, Caroline: Management of 256 Cases of Infection of the Immature Vagina, J. A. M. A. **112**: 411-417 (Feb. 4) 1939.

12. Benson, R. A.: The Treatment of Vulvovaginitis with Sulfanilamide, Tr. Am. Neisserian M. Soc., 5th annual meeting, 1939, pp. 136-139.

13. Cruickshank, R., and Sharman, A.: The Etiology of Leukorrhea in the Virgin, Tr. Edinburgh Obst. Soc., in Edinburgh M. J. **41**: 137-147 (Oct.) 1934. Shute, Evan: Vaginitis and Vulvitis Associated with an Excess of Estrogen in the Blood, J. A. M. A. **110**: 889-891 (March 19) 1938.

Council on Physical Therapy

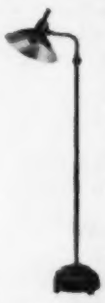
THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT. HOWARD A. CARTER, Secretary.

WESTINGHOUSE SUNLAMP MODEL NO. ES2404 ACCEPTABLE

Manufacturer: Westinghouse Electric and Manufacturing Company, Bloomfield, N. J.

The Westinghouse Sunlamp, Model No. ES2404, containing an S-4 type lamp, provides ultraviolet radiation of an intensity and spectral distribution rendering it suitable for unsupervised use by the layman. The ultraviolet source is mounted in a reflector on an adjustable support.

Type S-4 Mazda Sunlamp bulb consists of an electric arc discharge through mercury vapor, between activated metal electrodes sealed in a small quartz capillary tube, which in turn is enclosed in a bulb of special glass and is opaque to ultraviolet radiation of short wavelengths.



Westinghouse Sunlamp, Model No. ES2404.

Radiation passing through the quartz capillary tube is essentially that of the so-called "hot quartz" mercury arc. However, by enclosing the quartz lamp in a bulb of glass of a composition and thickness to absorb completely the intense emission lines of wavelengths shorter than about 2,800 angstroms, there remains a series of strong emission lines at 2,894, 2,967, 3,024 and 3,132 angstroms (and longer wavelengths) favorably situated in the spectral band of ultraviolet in sunlight recognized as having a specific therapeutic effect.

The S-4 Lamp is operated on the ordinary (115 volts) house lighting (alternating current) circuit but it requires an intermediary, especially designed, transformer to maintain the proper voltage and operating temperature. The approximate power used is 100 watts. In the lamps tested, on 115 volts input, the current through the lamp ranged from 2.1 to 2.3 amperes.

In order to determine whether the Type S-4 lamp complies with the Council's requirements of acceptability as a sun lamp, in addition to the data submitted by the manufacturer, spectral ultraviolet radiation measurements were made in a laboratory selected by the Council. These measurements fully confirmed the data submitted by the manufacturer showing that the radiation of wavelengths shorter than 2,800 angstroms is immeasurably small and hence these lamps qualify as sun lamps so far as spectral quality (wavelength) of radiation is concerned.

In this investigation the lamp was placed close in front of the quartz-fluorite achromatic spectroradiometer and the spectral intensities were measured with a vacuum thermopile. The relative spectral intensities (galvanometer deflections) corrected for absorption in the spectroradiometer are given in the accompanying table.

Spectral Intensities

Wavelength (Angstroms)	Relative Energy (Average of 3 Lamps)
3,132	7.96
3,024	2.59
2,967	1.15
2,894	0.28
2,804	0.09
	Total 12.07

The radiation at 2,804 angstroms (and shorter if measurable) is about 0.75 per cent of the total of all wavelengths, including 3,132 angstroms and shorter. Mounted in an aluminum reflector the radiation at 2,804 angstroms and shorter, relative to the total, would be still lower. Hence these lamps comply with the Council's requirements for acceptability of a sun lamp for spectral quality of ultraviolet radiation.

Erythema Test: The untanned inner upper arm, at a distance of 24 inches (61 cm.) from the lamp in an aluminum reflector,

was exposed to lamp number 12 on 108 volts for intervals of two, four, six, eight, ten, twelve and fifteen minutes. A mild erythema was obtained on six minutes' exposure. The exposures of eight minutes and longer were too long—still red after three days. With a standard voltage (115 volts) and a modern reflector the exposure time for a minimum perceptible erythema would be still shorter.

The Council on Physical Therapy voted to accept the Westinghouse S-4 Sunlamp for inclusion on its list of accepted devices.

Council on Pharmacy and Chemistry

PRELIMINARY REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING PRELIMINARY REPORT. PAUL NICHOLAS LEECH, Secretary.

PRELIMINARY REPORT ON HISTAMINASE: TORANTIL

According to reports in the literature, Torantil, an extract of intestinal mucosa of standardized histamine detoxifying potency marketed by Bayer (I. G. Farbenindustrie A. G.) for the treatment of allergic conditions and intestinal intoxications, was introduced into this country by the Winthrop Chemical Company as a brand of histaminase. The latter now markets a similar product under the same name but formerly used the provisional designation "T 360," under which identification it has been supplied to investigators in ampule form for experimental use. The concern markets the product in tablets of 5 units each, under the original name Torantil. In this form the preparation was submitted to the Council at its request.

The firm promotes Torantil as an "Antiallergic (Histamine-Detoxicating)" agent of the following description:

> Extract from the mucosa of the small intestines and desiccated kidneys of hogs, containing a histamine destroying enzyme, histaminase, in an active and stable form. Biologically standardized in histamine detoxicating units, one unit being the amount which will inactivate one milligram of histamine hydrochloride during incubation at 37.5 C. for twenty-four hours. Possesses all the known properties of histaminase.

The indications for Torantil are stated as follows:

> For use in the prophylaxis and treatment of allergic disorders, including asthma, hay fever (vasomotor rhinitis), urticaria, gastrointestinal disturbances, serum sickness, angioneurotic edema, atopic dermatitis, eczema, hypersensitivity to insulin, drugs and physical agents, such as cold, heat and light. Also employed in acne vulgaris.

The average initial dose of Torantil recommended by the manufacturer is from 10 to 15 units orally three times a day before meals, gradually increased to from 20 to 25 units in severe cases or decreased to a maintenance dose of from 10 to 20 units daily after clinical symptoms are controlled. Warning of possible unfavorable reaction from the use of the preparation in persons hypersensitive to hog protein is included in the firm's advertising. The firm distributes a descriptive card, "Torantil" (from which the quotations were made), three leaflets, "After Four Years of Persistent Investigations," "For Diseases of Allergy" and "Clinical Application of a New Concept of Allergy," three folders, "Effective Control of Many Allergies," "Physiologic Basis for a New Treatment of Allergy" and "Histaminase Treatment of Allergy," and a booklet, "Torantil," accompanied by a clipsheet, "Silver Jubilee of an Interesting Discovery." The last named piece refers to the discovery twenty-five years ago by Eustis [1] that lethal doses of histamine for guinea pigs can be inactivated by incubation with the liver pulp of the turkey buzzard at 38 C. for twenty-four hours. He believed this action to be due to some enzyme, since boiling temperature resulted in inhibition of the inactivating substance.

LITERATURE

In 1930 Best and McHenry [2] showed that simple saline extracts of various animal organs when used fresh and untreated had the property of destroying the histamine in a solution to which they were added. They found that almost every tissue contains a histamine-inactivating substance for which they proposed the name histaminase, because of properties characteristic of enzymes. By perfusion experiments they were able to demonstrate in the dog that the kidney and the intestine are the richest sources of histaminase. They reported a method of extraction and assay and suggested: "A convenient unit of histaminase would be the activity necessary to destroy 1 mg. of histamine during twenty-four hours' incubation at 37 C., in a phosphate buffer solution at p_H 7." The authors found that the change produced in histamine during inactivation appears to be oxidative, since it is inhibited by potassium cyanide under anaerobic conditions and is accelerated by oxygen. They also found that reduction of the iminazole value parallels the degree of inactivation of histamine and suggested that rupture of the iminazole nucleus occurs in the histamine or that a complex nondialyzable compound is produced. The authors conclude as follows: "Since it has not been established that histamine is the causative agent in any pathological condition there would be no obvious clinical application of histaminase, even if it should be established that the ability of an organism to inactivate histamine can be increased by administration of the enzyme."

The firm submits thirty-six references to reports in the literature, in addition to the one just reviewed, in support of its claims that histaminase is of prophylactic and therapeutic value in a variety of allergic manifestations. A review of these and other recent reports in the literature indicates the importance of the concluding statement of Best and McHenry, just quoted. Thus far reports do not definitely establish histamine as the exciting cause of any disease. Although there is some evidence that histamine produces effects similar to the reactions which occur in certain allergic states, the theory that it is the common denominator through which a variety of exciting causes can produce asthma has not been established. Evidence that histamine, the so-called effector set free by cellular injury, may be liberated by many different agents is accumulating, but there is no conclusive evidence to prove that an excess is invariably associated with various allergic manifestations. Difficulty has been encountered because of the small amount of histamine present in the blood of patients with asthma, which until recently could be detected only by cumbersome biologic methods. There has also been difficulty in determining the mechanism by which the organism may dispose of an excess of histamine.

The presence of a protective enzyme, histaminase, in nearly all tissues of most species has been confirmed by several investigators. While most species reveal the greatest quantities in the kidney, the absence of histaminase in the kidney of the rat has also been reported. Small amounts of histamine administered slowly by vein produce none of the effects usually observed, suggesting that the blood is able to inactivate small quantities gradually. This has been shown to be due not to histaminase but rather to the red cells which take up histamine and thus prevent its physiologic activity. Rose and Browne [3] have studied the question of what happens to histamine in rats when it is rapidly injected intravenously in both large and small doses. They first confirmed other reports that histamine disappears rapidly from the blood. In the rat they find that histaminase occurs only in the lung and small intestine, but within fifteen minutes after intravenous injection of histamine the tissues contain more histamine than the blood. After this time the rapidity of disappearance from the tissues occurs in the following order: blood, lung, lymph gland, liver and kidney. After thirty minutes the rate of disappearance is greater from the kidney than from the other tissues named. The authors hypothesize that, since the kidney of the rat contains no histaminase, the difference in the rate of disappearance of histamine may be due either to a transfer of histamine from other tissues to the kidney, which then destroys it gradually by another mechanism unable to gain headway with the continuous transfer until after thirty minutes, or to the slow liberation of transferred histamine from the kidney to the

1. Eustis, A. C.: Biochem. Bull. **4**: 97, 1915.
2. Best, C. H., and McHenry, E. W.: The Inactivation of Histamine, J. Physiol. **70**: 349 (Dec.) 1930.
3. Rose, Bram, and Browne, J. S. L.: The Distribution and Rate of Disappearance of Intravenously Injected Histamine in the Rat, Am. J. Physiol. **124**: 412 (Nov.) 1938.

histaminase-containing tissues, where it is inactivated. It has been shown that histamine is not excreted in the urine of the rat within three hours after injection. Experiments of the authors show that adrenalectomy markedly retards the rate of disappearance of histamine from the tissues, especially the kidney. The essential importance of the study is to suggest that factors other than histaminase may defend the organism against the action of histamine.

Attempts to demonstrate the importance of histamine inactivation in combating symptoms of various allergic states have been made by a few investigators whose reports of results of treatment with histaminase may be found in the literature. Recently Karady and Browne [4] demonstrated that histamine and anaphylactic shock were effectively prevented by parenteral preadministration of histaminase in guinea pigs given large doses of histamine or egg white after previous sensitization with this protein. Of the ten animals in each of the two untreated control groups given histamine and egg white, only seven and four given histamine and egg white respectively died. These control results further support the belief that a physiologic mechanism other than histaminase may be effective in combating an excess of histamine. Foshay and Hagebusch [5] report the symptomatic relief of serum sickness in twenty of twenty-two patients treated with oral and intramuscular histaminase. Both these reports are based on the use of Torantil furnished by the firm.

Prickman,[6] in the discussion of Serum Sickness: Effective Treatment and Probable Prophylaxis by Means of Histaminase, reviewed by Dr. Lee Foshay at the eleventh annual meeting (Chicago, Nov. 4 and 5, 1938) of the Central Society for Clinical Research, reported relief in only 34 per cent of twenty-six cases of vasomotor rhinitis treated orally with histaminase. He indicated that the results reflect an apparent variability in the potency of the preparation and finds a limit to the tolerance for it in one case due to food sensitivity. Distressing abdominal cramps were produced when the dose was increased beyond a certain limit. In the same discussion, Roth [6] confirmed Dr. Prickman's observation of the variability of the potency of the material in her review of continued good results from its oral use in patients hypersensitive to cold and insulin. Foshay [6] pointed to the probability that the product is a mixed substance and that others also have reported variance of potency in different batches of the material. He indicated that his studies were based on cases treated from a single batch of the material and that less prompt relief of symptoms is obtained by the use of enteric-coated tablets than when the preparation is administered intramuscularly.

Roth and Rynearson [7] report further varying results with the oral use of Torantil in the treatment of prolonged local cutaneous reactions due to insulin sensitivity. Some of the failures in the twelve cases reported were attributed to a decreased potency of the particular batch of material used in the study. Laymon and Cumming [8] administered histaminase orally and intramuscularly for from four days to three weeks in the treatment of seventeen cases of urticaria and obtained ten cures and two improvements. The average time for a cure was 10.7 days. Of the cases of atopic dermatitis treated, none were improved. Rackemann [9] summarizes briefly the recent literature on allergy and, with reference to its relation to histamine, aptly indicates the present uncertain state of knowledge concerning histamine and so-called histaminase. Miller and Piness [10] report the failure of histaminase to give unequivocal evidence that this enzyme was responsible for the relief or prevention of any of the signs or symptoms in forty-two allergic patients treated with Torantil supplied by the firm under the experimental name T 360.

4. Karady, S., and Browne, J. S. L.: Effect of Histaminase Treatment on Histamine and Anaphylactic Shock in Guinea Pigs, J. Immunol. **37**: 463 (Nov.) 1939.

5. Foshay, Lee, and Hagebusch, O. E.: Histaminase in the Treatment of Serum Sickness, J. A. M. A. **112**: 2398 (June 10) 1939.

6. In discussion on Foshay, Lee and Hagebusch, O. E.: Serum Sickness: Effective Treatment and Probable Prophylaxis by Means of Histaminase, abstr. J. A. M. A. **112**: 1102 (March 18) 1939.

7. Roth, Grace M., and Rynearson, E. H.: Proc. Staff Meet., Mayo Clin. **14**: 353 (June 7) 1939.

8. Laymon, E. C., and Cumming, H. J.: Histaminase for Urticaria and Atopic Dermatitis: Preliminary Report, J. Invest. Dermat. **2**: 301 (Dec.) 1939.

9. Rackemann, F. M.: Allergy: A Review of the Literature of 1939, Arch. Int. Med. **65**: 185 (Jan.) 1940.

10. Miller, Hyman, H., and Piness, George: Histaminase in the Treatment of Allergy, J. A. M. A. **114**: 1742 (May 4) 1940.

[Since the foregoing report was set in type, several additional papers have appeared in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION as follows: Among them is one by Keeney (**114**: 2448 [June 22] 1940), in which oral administration of histaminase failed to give relief. Another article by Corper and Cohn reports that histaminase of pre-determined in vitro strength did not appreciably retard intoxication (general or cutaneous hypersensitiveness) produced by an intoxicating injection of the specific tuberculoprotein in guinea pigs previously sensitized to the protein. Best and McHenry of the University of Toronto, in the correspondence note to the editor (**115**: 235 [July 20] 1940), point out that neither their original report, nor in any subsequent publication by them, has it been suggested that the administration of histaminase might be a useful mode of therapy. They indicate that they have been unable to confirm the results of Karady and Browne in the protection of guinea pigs against anaphylactic and histamine shock with histaminase. The article by Goldberg, to which reference was made in this report, has also been published (**115**: 429 [Aug. 10] 1940).—ED.]

LETTERS FROM PHYSICIANS

Several letters from physicians written at the request of the Winthrop Chemical Company contain statements (mostly opinions) favorable to the use of Tortantil in allergic conditions. Grafton T. Brown of Washington, D. C., reports the oral use of Torantil in fifty or more cases comprising urticaria, asthma, perennial hay fever, eczema, migraine and other allergic manifestations. He reports the use of the product, injectable form, in one case of migraine without benefit. Briefly he gives his impressions on the oral use. He seldom notes toxic manifestations; possibly two patients may have had bad effects from the preparation. This would seem doubtful as they were very nervous and complained about a great variety of drugs when administered. He reports no benefit in cases of bronchial asthma, vasomotor rhinitis, pruritic dermatitis or migraine. Some of the cases of urticaria and angioneurotic edema were benefited. He reports encouraging results in physical allergy (heat and cold).

Robert L. Nelson, Duluth, Minn., tells of observations he reported before the St. Louis Medical Society. He states that he obtained complete relief in mild hay fever of ragweed types. Severe types were completely controlled when the pollen count was low but received no benefit when the patients went into an area where the pollen concentration was high. Two of his ragweed cases were complicated by asthma during the hay fever attacks and apparently were much benefited by the drug. The effect of the drug wore off in thirty-six hours. It is interesting to note that he reports one case sensitive to pork which was refractory because of the pork origin of the product. This is hard to understand if histaminase is the key to the cure of allergy. He further reports several cases of "cold in the head" in which there was complete relief!

A letter from Dr. C. M. Charles of St. Louis includes excerpts from a manuscript in preparation. His experience has been that many cases require high daily doses for control, as much as 150 units, which would be thirty tablets. Treatment in several of his cases with migraine was complicated by the use of other drugs, ergotamine tartrate and ephedrine. Some of the cases lead to certain doubts, since the migraine disappeared not to return for several weeks after administration of Torantil was stopped. He reports cases of bronchial asthma that were benefited but the follow-ups on these cases are too short to afford a basis for final conclusions. Vasomotor rhinitis, mostly ragweed hay fever cases, seem to have been benefited mostly on the larger doses. However, there is considerable variability in the benefits.

Dr. R. O. Muether of St. Louis University School of Medicine reports treating ten cases of rheumatoid arthritis, fifteen cases of primary dysmenorrhea, three cases of asthma, two cases of idiopathic migraine, three cases of menstrual migraine, two cases of urticaria and three cases of allergic rhinitis. While not definitely stated, the letter implies favorable results when adequate doses are employed in the treatment of these conditions. Patients with rheumatoid arthritis were not "markedly improved" but when "swelling was present this was often relieved." Eight of the ten thought they were less stiff and had less pain. Eleven of the fifteen cases of primary dysmenorrhea were benefited in from three to six menstrual periods. "In several instances when the drug was stopped the difficulty recurred only to disappear when the drug was resumed."

Dr. Omer E. Hagebusch, St. Louis, reports the use of Torantil in fifty-five cases of serum sickness including all grades of severity some of "almost fatal type"! "In all but three cases

there has been a very prompt and gratifying relief of symptoms." Thirty-five patients with undulant fever or tularemia who were to receive serum received the product. "When the dose was adequate we could almost always prevent the occurrence of serum sickness." And those developing serum sickness had mild attacks. No toxic effects were noted even though forty tablets a day for five days were given to an occasional patient. Dr. Patrick Nagle, Oklahoma City, telling of his experience, writes "Therapeutic response in some cases has been quite encouraging, in many cases has been discouraging" and feels that "no final word may be passed upon the product at this time."

Dr. Ben A. Newman of Los Angeles writes: "My experience with the use of histaminase has been limited to a relatively small group of patients, but well controlled. All the patients upon whom the drug was used had previously been treated with all the known orthodox measures without effect; and during the period of histaminase exhibition all other active therapy was withheld. Only two dermatoses were studied, neurodermatitis and chronic urticaria. Acute urticarias were not included in my series since I felt the evaluation of therapy would be impossible." He reports no effect in six cases of generalized neurodermatitis (atopic eczema) and four cases of localized neurodermatitis (lichen simplex chronicus). Of five patients with giant urticaria and angioneurotic edema one was not benefited; three were completely relieved with the exception of small evanescent urticarial lesions, permitting gradual reduction of the dose and eventual withdrawal, and one was markedly relieved while taking large doses (from fifteen to eighteen tablets daily) but relapsed when the drug was discontinued. The identity of the orthodox control measures employed as initial treatment is not stated.

(The foregoing communications are those which were received up to May 1, 1940. Similar letters continue to be received, but thus far these offer no evidence of further significance.)

Three manuscripts are submitted by the firm. One, by Ray Williams, H. L. Alexander and T. Kirchner of St. Louis on "The Action of Histaminase on the Histamine Content of the Blood of Rabbits," is a good report of experimental work but has little bearing on the value of Torantil in the treatment of allergic states in human beings. A second paper, by Grace M. Roth and Bayard T. Horton of the Mayo Clinic, on "Histaminase: Physiologic Effects on Man and Its Therapeutic Value in Medicine," was presented at the New York Academy of Medicine before the Section on Medicine, April 16. Slides were used in presentation and no tables or protocols accompany the paper. These authors report ten cases of hypersensitiveness to cold in which following the administration of histaminase for several days only slight systemic or local reaction occurred following immersion of the hand in water at 10 C. for seven minutes. In a few no reaction occurred. All patients previous to the ingestion of histaminase had marked reaction following the procedure. Instances of determination of the gastric acidity before and after the administration of histaminase are described. Marked decrease in the gastric acidity followed the ingestion of the product. "Erythromelalgia of the head," a new syndrome described by Horton (one of the authors) a year ago, yields to histaminase. "We feel that not only is 'desensitization' with histaminase a specific treatment for 'erythromelalgia of the head,' but our recent observations with the use of histaminase leads us to believe that it is almost as effective as 'desensitization with histamine.'" Of seventeen patients with serum sickness, relief in fourteen within eighteen to thirty-six hours was observed. There was no relief in three. When histaminase was started simultaneously with serum in thirteen patients, no serum sickness occurred in eight, only transient urticaria appeared in three and no relief in two. From 45 to 60 units of histaminase administered orally each day to twelve patients with insulin allergy relieved ten. The authors report that eighteen patients with vasomotor rhinitis were relieved of nasal obstruction, watery discharge and sneezing, with definite improvement in the appearance of the nasal membrane, eight patients were benefited, and fourteen patients expressed no relief. These observers have used histaminase in 150 patients without untoward effects. The third manuscript is by Alexander Altose, on "The Treatment of Certain Allergic Skin Conditions with Histaminase," read before the King County Medical Society, Seattle, in March of this year. Torantil was supplied by the firm. The author reports the results of treatment of eighteen subjects with urticaria, angioneurotic edema and allergic dermatitis: eight greatly improved, six moderately improved and four unimproved.

SUMMARY

The use of histaminase in allergic manifestations was suggested because of the hypothetic histamine-like substance which may be responsible for all allergic responses. In the opinion of the Council this use of histaminase in the treatment of allergic states, although perhaps ingenious and suggestive, has no well established scientific clinical basis. In attempting to evaluate the clinical evidence the Council is confronted with conflicting data. Some physicians report success in one condition and others a lack of it, although enthusiasm is expressed in most of the reports available. What is lacking is a thoroughgoing study over a sufficient period (most of the case reports have been collected during the past year), alternating placebos with the histaminase to see if the effect is real or fanciful. In some of the reports, lack of success is attributed to low potency, though the firm now assures the Council that it has worked out the problems of uniform potency. The unpredictability and variability of allergic phenomena causes the Council to pursue a conservative course toward the efficacy of histaminase in the treatment of these conditions. In any event the name Torantil is meaningless and is not acceptable. The Council does not wish to discourage further experimental investigation of histaminase under rigidly controlled conditions.

The Council voted that, as a brand of histaminase, Torantil lacks evidence to justify its present inclusion in N. N. R.; further, that it is marketed under an objectionable name with claims which are not justified. The Council decided to hold in abeyance further consideration of histaminase and of Torantil until the development of further evidence and authorized publication of the foregoing preliminary report.

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

AMINOPHYLLINE (See New and Nonofficial Remedies, 1940, p. 555).

Aminophylline-Merrell.—A brand of aminophylline-N. N. R.

Manufactured by the Wm. S. Merrell Co., Cincinnati, Ohio. No U. S. patent or trademark.

Ampul Solution Aminophylline-Merrell, 0.48 Gm. (7½ grains), 2 cc.
Ampul Solution Aminophylline-Merrell, 0.24 Gm. (3¾ grains), 10 cc.

ASCORBIC ACID-SQUIBB—(See New and Nonofficial Remedies, 1940, p. 532).

The following dosage form has been accepted:

Tablets Ascorbic Acid-Squibb, 100 mg.: Each tablet is equivalent to 2,000 international units of vitamin C.

SODIUM CACODYLATE (See New and Nonofficial Remedies, 1940, p. 109).

Endo Products, Inc., Richmond Hill, New York.

Ampoules Sodium Cacodylate-Endo, 0.065 Gm. (1 grain), 1 cc.: Benzyl alcohol 1 per cent is added for its local anesthetic effect.
Ampoules Sodium Cacodylate-Endo, 0.13 Gm. (2 grains), 1 cc.: Benzyl alcohol 1 per cent is added for its local anesthetic effect.
Ampoules Sodium Cacodylate-Endo, 0.2 Gm. (3 grains), 1 cc.: Benzyl alcohol 1 per cent is added for its local anesthetic effect.
Ampoules Sodium Cacodylate-Endo, 0.3 Gm. (5 grains), 1 cc.: Benzyl alcohol 1 per cent is added for its local anesthetic effect.
Ampoules Sodium Cacodylate-Endo, 0.5 Gm. (7½ grains), 1 cc.: Benzyl alcohol 1 per cent is added for its local anesthetic effect.

THIAMIN CHLORIDE-ABBOTT (See New and Nonofficial Remedies, 1940, p. 529).

The following dosage forms have been accepted:

Tablets Thiamine Hydrochloride-Abbott, 9 mg.: Each tablet contains 3,000 U. S. P. units of thiamine hydrochloride.
Tablets Thiamine Hydrochloride-Abbott, 12 mg.: Each tablet contains 4,000 U. S. P. units of thiamine hydrochloride.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, SEPTEMBER 21, 1940

THE PLATFORM OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association advocates:

1. The establishment of an agency of the federal government under which shall be coordinated and administered all medical and health functions of the federal government exclusive of those of the Army and Navy.

2. The allotment of such funds as the Congress may make available to any state in actual need, for the prevention of disease, the promotion of health and the care of the sick on proof of such need.

3. The principle that the care of the public health and the provision of medical service to the sick is primarily a local responsibility.

4. The development of a mechanism for meeting the needs of expansion of preventive medical services with local determination of needs and local control of administration.

5. The extension of medical care for the indigent and the medically indigent with local determination of needs and local control of administration.

6. In the extension of medical services to all the people, the utmost utilization of qualified medical and hospital facilities already established.

7. The continued development of the private practice of medicine, subject to such changes as may be necessary to maintain the quality of medical services and to increase their availability.

8. Expansion of public health and medical services consistent with the American system of democracy.

THE CLOSED PLASTER METHOD OF TREATING COMPOUND FRACTURES AND INFECTED WOUNDS

The treatment of compound fractures and infected wounds during the war of 1914-1918 underwent numerous changes. The general trend was toward the local use of chemicals to kill the bacteria and check the sepsis. Carrel and Dakin, the last and most successful exponents of this trend, introduced on a large scale continued irrigation of the wound with sodium hypochlorite, the antiseptic property of which was combined with weak toxicity for tissues. The postwar contributions of Baer of Baltimore and of H. Winnett Orr of Lincoln, Neb., introduced a new principle in the treatment of these conditions, that of physiologic rest to the injured part. The principle is embodied in Orr's closed plaster method, the essential feature of which is the complete immobilization of the soft tissues. No attempt is made to kill the organisms by external agents. The reliance is placed entirely on the ability of the body to resist bacterial infection.

The first large scale experiment in the appliance of these principles was made possible in the Spanish war. There chiefly owing to the enthusiasm of Trueta, chief surgeon of the General Hospital of Catalonia, the method was adopted in the medical service of the republican army. The total number of cases treated was 20,000. The incidence of gas gangrene and of other infections fell so definitely that foreign surgeons who came to Catalonia at the later stages of the war were led to believe that the soil of Spain contained no anaerobes.

The method, as described in Trueta's [1] recent monograph, is carried out in the following manner: Surgical treatment is undertaken as soon after occurrence of the fracture as possible; with the patient anesthetized, thoroughly wash the entire extremity and the wound with soap and water and a nail brush, shave all hair and paint the surrounding skin with a weak solution of iodine; excise the skin edges of the wound, remove all contused tissue and widen the wound; excise carefully and unhesitatingly all nonviable muscular and cellular tissues; open up the neighboring cellular surfaces affected by contusion, always keeping in mind the need for adequate drainage; remove all foreign material; reduce the fracture by traction on an orthopedic table; dress the wound with sterile gauze and immediately immobilize with plaster including the two adjoining joints if possible. The plaster is applied according to the method of Bohler directly to the skin, only the bony prominences being padded; administer 3,000 units of tetanus antitoxin. It is not permissible to cut a window in the cast, since this deprives the soft tissues of much needed immobilization. "It can be observed," says Trueta, "that the tissues swell into the gap in the plaster and their healing power is correspondingly weakened." This is in essence Orr's treatment with a single exception, namely that Trueta employs dry gauze as dressing for the wound instead of Orr's petrolatum pack. The plaster is left in position as long as the smell is not excessive and the plaster has not become soft and wet. It may be left in position for from four to six weeks and then replaced and left in position until such time as the fracture has healed.

Orr [2] obtained good results with this method in from 85 to 90 per cent of compound infected fractures in

1. Trueta, J. J.: Treatment of War Wounds and Fractures with Special Reference to the Closed Method as Used in the War in Spain, New York, Paul B. Hoeber, Inc., 1940.

2. Orr, H. W.: Treatment of Compound Fractures with Special Reference to Military Surgical Procedures, Arch. Surg. **40**: 825 (May) 1940.

civilian practice. The method, according to Trueta, is particularly adapted to conditions of modern warfare, in which in addition to the usual military casualties there are large numbers of civilians wounded by aerial bombardment. In Trueta's own material there were 1,073 cases of compound fractures of the limbs, most of them war wounds. There were six fatalities, 976 good or satisfactory results and ninety-one poor results. Trueta expresses the belief that no other treatment could have enabled them to alleviate for so many victims the horrors of war and air raids. Dr. Matas,[3] who had an opportunity to observe the method in the Catalonian war zone, writes: "I had an opportunity to see several plaster encasements removed from arms and thighs after they had been in situ for from fifteen to twenty-one days. The stench of the soiled encasement was nauseating. A magma or mush of decomposing pus and wound secretions covered the surface of the wound under the plaster bandage. But after washing this off with warm water and soap, and when the packs were removed, I was surprised to see the excellent, healthy, pink, well granulated appearance of the wound coupled with a very satisfactory condition of the patients—no fever, no pain, good appetite. This was indeed a revelation I did not anticipate." Matas quotes Dr. Jiméno of Banolas, under whose direction there were treated 6,000 fractures, of which 500 were fractures of the femur, with a mortality for the total group of 3.2 per cent. There was only one case of gas gangrene and this one had appeared before admission to the hospital.

The rationale of treatment is based on the following considerations: 1. Rest allows local veins and capillary thrombi to form. These prevent and delay the spread of infection and are not broken down by repeated handling. 2. Rest allows new capillaries to form which are not torn down by repeated dressing of the wound. 3. The plaster maintains a constant beneficial pressure on the wound; the calcium in it may be of local value much as the calcium gluconate exuded by the maggots according to Stewart. 4. The mixture of organisms on the wound may by their mutual antagonism prevent the victory of any one group. 5. To leave a deep wound uncovered produces dehydration and loss of heat leading to a condition of shock. The success of the method depends in a large measure on a thorough understanding of the underlying principles and rigid adherence to a meticulous technic. "It is fallacious to believe," warns Trueta, "that it suffices to enclose a wounded limb in a plaster of paris cast to achieve the benefits of closed treatment." He emphasizes that the method should be employed by those qualified by training to plan and undertake the first stages of the technic, which are purely surgical.

3. Matas, Rudolph: Discussion, Ann. Surg. **112:** 267 (Aug.) 1940.

HISTAMINE AND ANAPHYLAXIS

Haag and Lutz,[1] of Düsseldorf, and Farmer,[2] of Lenox Hill Hospital, New York, have shown that anaphylactic shock may be decreased in severity by at least two types of antihistamine therapy. These demonstrations go far to settle one of the historic controversial questions in allergic physiology. Since the time of the late Victor C. Vaughan, speculative theories of anaphylaxis have centered around the question of secondary toxicity. Vaughan's original assumption that the dominant symptoms in anaphylaxis are due to "anaphylatoxins" formed by partial hydrolysis of parenterally injected foreign proteins was eventually discarded. It was replaced by the Dale-Laidlaw[3] theory, which assumes that stored-up vasodilator substances are set free by the fixed tissue cells as a result of antigen-antibody reactions and that these freed histamine-like substances are the immediate cause of the typical allergic symptoms. This histamine theory has been subjected to extensive biochemical and physiologic research. A definite increase of histamine-like substances in the liver, spleen and bronchial musculature, for example, results from experimental protein sensitization. A liberation of these stored vasodilator substances follows local tissue injury. Bartosch and his co-workers,[4] for example, applied perfusion methods to hypersensitive lungs and found that such substances are set free into the perfusion fluid as a result of allergic bronchoconstriction.

Physiologic assays have shown that relatively large amounts of histamine are normally present in the stomach wall. The walls of the small intestine in contrast are practically free from histamine. From this it has been deduced that there is presumably a histamine-destroying enzyme in intestinal tissues. This deduction has been confirmed by the recent extraction of a powerful histaminase from the normal intestinal mucosa. This enzyme has been tentatively standardized, the provisional unit being the amount of extract necessary to destroy or inactivate 1 mg. of histamine in vitro by the end of twenty-four hours' incubation at 37 C. Rose and Browne,[5] however, found in the rat that histaminase occurs only in the lung and small intestine but that within fifteen minutes after intravenous injection of histamine the tissues contain more histamine than the blood. After fifteen minutes the rapidity of disappearance from the tissues occurs in the following order: blood, lung, lymph gland, liver and kidney. After thirty minutes the rate of disappearance is greater from the kidney than from the other tissues named. Adrenalectomy was shown to retard the rate of disappearance

1. Haag, F. E., and Lutz, Lorenz: Ztschr. f. Immunitätsforsch. **96:** 117 (July) 1939.
2. Farmer, Laurence: J. Immunol. **36:** 37 (Jan.), **37:** 321 (Oct.) 1939.
3. Dale, H. H., and Laidlaw, P. P.: J. Physiol. **52:** 355 (March) 1919.
4. Bartosch, R.; Feldberg, W., and Nagel, E.: Arch. f. d. ges. Physiol. **230:** 674 (Sept.) 1932; **231:** 616 (Jan.) 1933.
5. Rose, Bram, and Browne, J. S. L.: The Distribution and Rate of Disappearance of Intravenously Injected Histamine in the Rat, Am. J. Physiol. **124:** 412 (Nov.) 1938.

of histamine from the tissues, especially the kidney. These results suggest that factors other than histaminase may defend the organism against the action of histamine.

If the Dale-Laidlaw theory of anaphylotoxin is correct, one might predict that this histamine-destroying enzyme injected parenterally would have prophylactic or therapeutic effects in anaphylactic shock. This prediction was tested by Haag and Lutz, who found that in guinea pigs a single intraperitoneal injection of one unit of this enzyme, given a few hours before the allergic test, greatly reduces the severity of the resulting anaphylactic shock. In no case, however, did such injection completely prevent the anaphylactic reaction, a result that was in accord with the Dale theory. Similar results have been obtained by Karady and Browne,[6] who found that some animals not protected by the preadministration of histaminase survived large doses of histamine and egg white, the latter given to animals previously sensitized to this protein. The alleged prophylactic effect is presumably due to an enzymic reduction in the amount of available histamine in the fixed tissues.

A somewhat different method of therapeutic attack was made possible by Fuehner's[7] observation that "refractoriness" to histamine can be induced in experimental animals by repeated parenteral injections of increasing doses of histamine. If the anaphylactic symptoms are due to fixed-tissue liberation of histamine, such histamine-refractory animals presumably would be relatively insusceptible to anaphylactic shock. In order to test this conclusion, Farmer gave a series of sensitized guinea pigs repeated intraperitoneal injections with histamine over a period of from twelve to eighteen days. He then tested the reactions of uterine strips from these animals by the routine Schultz-Dale technic, control tests being made with strips removed from sensitized guinea pigs that had not received histamine therapy. Titrations of allergic sensitivity showed that the uterine musculature of the treated guinea pigs was not only refractory to histamine but at the same time distinctly less sensitive to specific foreign protein. While 65 per cent of the control strips reacted to 1:250,000 dilutions of specific foreign protein, but 22 per cent of the treated strips reacted to this dilution. This suggests a threefold reduction in allergic sensitivity as determined by his arbitrary test dose.

Farmer afterward found that a similar though less effective histamine refractoriness with accompanying reduction in protein sensitivity can be conferred on guinea pigs by repeated oral administration of histamine. His effective antianaphylactic dose was 3 mg. of ergamine phosphate given by mouth at two to three day intervals over a period of two to three weeks.

Farmer's general conclusion from his data is that "histamine is the substance responsible for the anaphylactic contraction of plain muscle." This is essentially a confirmation of the Dale-Laidlaw theory of anaphylaxis. The clinical value of induced histamine refractoriness in allergic disease, however, has not yet been determined.

6. Karady, S., and Browne, J. S. L.: Effect of Histaminase Treatment on Histamine and Anaphylactic Shock in Guinea Pigs, J. Immunol. **37**: 463 (Nov.) 1939.
7. Fuehner, H.: München. med. Wchnschr. **59**: 852, 1912.

Current Comment

THE SELECTION OF MILITARY PILOTS

Many factors enter into the proper choice of men who are qualified to fly combat planes, including age, inherent psychologic ability and, of course, such well recognized physical qualities as eyesight, coordination and sound cardiovascular functioning. Numerous problems are also involved in care of fliers after their training. Methods have been or are now being devised to detect potential "air neuroses," to counteract the effects of lack of oxygen due to high altitudes and to study countermeasures against the so-called black-out which apparently results from insufficient circulation to the brain during rapid descent. The subject is far too complicated for brief discussion but is receiving serious attention in such publications as the German Army's Medical Guide for Flying Personnel, in the book by Armstrong on the "Principles and Practice of Aviation Medicine" and even in such periodicals as the current issue of *Fortune*. The study of the entire subject requires the active cooperation of physiologists and physicists and has resulted in a new specialty in medical practice—the flight surgeon.

DEATHS FROM POISONING IN MASSACHUSETTS

About 10 per cent of the deaths certified by medical examiners over a ten year period in Massachusetts were recorded as due to ingestion of toxic substances, according to a recent study by Alexander and his co-workers.[1] There were in all 8,661 such cases. Of these 4,505 were directly related to the ingestion of ethyl alcohol, this substance being responsible for 52 per cent of all deaths due to poisoning in the medicolegal sense. Illuminating gas accounted for 21 per cent and "nontherapeutic chemicals" for 11 per cent. Carbon monoxide other than illuminating gas caused 8 per cent and surgical anesthetics 4 per cent of all fatalities due to toxic substances. Sedative drugs were responsible for 3 per cent and nonsedative drugs for 1 per cent of the deaths. Of the 271 deaths from sedative drugs 152 resulted from barbiturates, eighty-seven from alkaloids, including opium and its derivatives, eight from paraldehyde, six from chloral, six from bromides and twelve from undefined sedative drugs. Alchoholic individuals were represented in each of these groups. Of the total deaths from sedative drugs 56.1 per cent were accidental, 36.5 per cent suicidal, 16.2 per cent alcoholic and 17.4 per cent unknown. The most striking feature of the report is the high percentage of deaths from poisoning which are due to ethyl alcohol.

1. Alexander, Leo; Moore, Merrill, and Leary, Timothy: Deaths from Poisoning, Incidence in Massachusetts, Am. J. M. Jurisp., vol. 2, No. 7, 1939.

MEDICAL PREPAREDNESS

In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.

MEDICAL REGIMENT TRAVELS THREE THOUSAND MILES

The First Medical Regiment, which for eighteen years had been stationed at the Field Service School at Carlisle Barracks, Pa., arrived in Camp Ord, California, June 28, after having marched 3,102 miles in fourteen days. The regiment averaged more than 250 miles each marching day and on some days made more than 300 miles. Almost the entire distance was made over U. S. Highway 40, although U. S. Highway 30 was followed through the mountains. The regiment consisted of seven officers of the medical corps and 180 enlisted men under the command of Lieut. Col. Robert P. Williams. The march was made without a single serious injury and only one slight accident to a motorcycle sergeant, who was struck by a civilian car.

INSTRUCTION IN AVIATION MEDICINE

A six weeks course of instruction to qualify physicians for military duty as medical aviation examiners was recently completed at the School of Aviation Medicine, Randolph Field, Texas, the commandant of which is Lieut. Col. F. L. Pratt, M. C. About thirty medical officers were enrolled for the course. The School of Aviation Medicine also conducted a resident course of instruction to qualify enlisted specialists which was attended by twenty-six enlisted men of the medical department, including one noncommissioned officer of the National Guard of Washington. The School of Aviation Medicine, in addition to resident courses, throughout the year, conducts extensive correspondence courses.

EXAMINATION FOR APPOINTMENT IN MEDICAL CORPS OF NAVY

Examinations for appointment as assistant surgeon and acting assistant surgeon (intern) in the Medical Corps of the U. S. Navy will be held Jan. 6-9, 1941, it is announced. The appointments as assistant surgeon in the regular Navy will be effective in about two months after the examination and those for acting assistant surgeon (intern) will be effective July 1, 1941. Requests for authorization to appear for these examinations should be submitted to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., in time to permit the authorization to reach the applicant prior to December 30.

Applicants for appointment as assistant surgeon must be citizens of the United States between the ages of 21 and 31, must be graduates of recognized medical schools and must have completed one year of intern training in a hospital approved by the Council on Medical Education and Hospitals of the American Medical Association. Applicants for the appointment as acting assistant surgeon (intern) are not required to submit evidence of intern training and are appointed for eighteen months to serve as interns in naval hospitals. After one year of service they are eligible for examination for appointment as assistant surgeons.

In the normal rotation of assignments, the naval officer's preference is given every practicable consideration for the type of duty he desires, according to the announcement. Officers are encouraged to develop a specialty after they have completed their first cruise at sea and provision is made for special training. Information about physical requirements, rates of pay and other details may be obtained by addressing the Bureau of Medicine and Surgery, Washington, D. C.

Appointments are also being made in the Medical Corps, U. S. Naval Reserve, of male citizens who are under 50 years old and who meet physical and professional requirements.

Applications for appointment to the Medical Corps of the Naval Reserve should be addressed to the commandant of the naval district in which the applicant resides. Addresses of the commandants may be obtained from the Bureau of Medicine and Surgery.

GRADUATES OF MEDICAL FIELD SERVICE SCHOOL

At the Medical Field Service School, Carlisle Barracks, Pa., in June graduation exercises were held for the second basic class, at which Brig. Gen. Roger Brooke of the U. S. Army Medical Corps, commandant of the field service school, delivered the address. All officers of the graduating class took part in the maneuvers of the third army at Fort Benning, Ga., and in the Sabine Area. Half of the graduating class were attached to medical regiments and battalions having these maneuvers and half were attached to regimental medical departments. These assignments were later alternated so that each student could get experience with the various medical units. The physician graduates of the Field Service School were as follows:

CAPTAINS

W. H. Amspacher
J. E. Tate

FIRST LIEUTENANTS

H. L. Berman
H. C. Boyd
G. C. Boyer
J. W. Brown
M. D. Buscemi
G. J. Collins
R. B. Croissant
W. N. Donovan
C. N. Ekman
R. T. Jenkins
H. S. Johnson
T. D. Johnson
N. E. King
A. W. Kuske
W. T. Lane
R. N. Lehman
R. H. Looney Jr.
R. Loughmiller
E. R. Marshall
J. T. Martin
C. E. Melcher
C. K. Morris
M. P. Moursund
R. L. O'Toole
N. E. Peatfield
W. N. Piper
D. E. Reiner
G. L. Richey
F. J. Shaffer
R. B. Sigafoos
B. E. Smith
R. C. Stiles
W. K. Sullivan
A. P. Thom 3d
D. E. Thomas

ORGANIZATION SECTION

OFFICIAL NOTES

COUNCIL ON INDUSTRIAL HEALTH

Report of July Meeting

The sixth meeting of the Council on Industrial Health took place on July 14, 1940, at the Palmer House in Chicago. Members in attendance were Stanley J. Seeger, chairman, Harvey Bartle, Leroy U. Gardner, Henry H. Kessler, Anthony J. Lanza, Robert T. Legge, C. W. Roberts, R. L. Sensenich (ex officio), Olin West (ex officio) and Carl M. Peterson, secretary. Also in attendance were Miss Joanna Johnson, chairman of the Industrial Nursing Section of the National Organization for Public Health Nursing, R. G. Leland, director of the Bureau of Medical Economics of the American Medical Association, and Paul A. Neal, acting chief, Division of Industrial Hygiene of the National Institute of Health.

Transactions of interest to the profession were as follows:

1. The Committee on Nomenclature reported further progress on material being collected for a compendium of terms used in the industrial health field.

2. The Committee on State Associations has continued to press for the appointment of cooperating committees in all state medical associations. There are now thirty-five such organized units. A uniform program has been submitted to these state committees and recommendations forwarded in respect to committee personnel. Active assistance will be sought from the organized state units in and through medical preparedness.

Attention will be called to the recent action of the House of Delegates relative to medical representation on boards administering workmen's compensation laws and regarding the preparation of fee schedules.

3. The Committee on Education and Publications submitted plans for the second Industrial Health Number of THE JOURNAL and for a series of special publications on medical service in industry and on occupational disease. A syllabus intended to assist in the development of adequate industrial medical education is now in preparation. The committee also reported recent improvements which have occurred in the field of undergraduate and postgraduate industrial medical education. During the past year exhibits have been prepared and demonstrated at medical society meetings and elsewhere.

4. The Council intends to continue to develop a clearing house of information on all industrial health matters. Methods of gathering and disseminating information were considered.

5. The census of physicians engaged in industrial practice recently made by the Council will shortly be augmented by data received through the Medical Preparedness Committee survey of medical personnel. To all such physicians a further questionnaire will be sent to determine qualifications for special industrial health assignments and special medical facilities now available.

6. The means for practical working relationships with the Committee on Industrial Dermatoses of the Section on Dermatology and Syphilology were discussed.

7. Lists of reliable textbooks and references are under preparation in the Council office as steps toward developing an industrial health bibliography.

8. The Council took note of the present status of legislation regarding industrial health under consideration in the present Congress.

9. The Council reviewed contacts recently established with other agencies interested in industrial health matters.

10. Plans were presented for the development of field work to make more effective the work of the Council and its cooperating committees in the state and county medical societies and to determine how the resources of physicians in the various states can be assembled and coordinated to constitute an effective health program in industry.

Attention was also directed to the contribution which a program of field activity could make to medical preparedness.

11. The Council received a report on syphilis in industry, preliminary to the development of a set of principles to be observed in the matter of case finding and management of syphilis among the employed population.

12. Attention was directed to the growing practice of industrial physical examination.

13. The subject of industrial nursing was considered, especially the means available to the Council for active assistance to the industrial nurse and industrial nursing organizations to improve the preparation and qualifications for an industrial nurse, to define proper functions, and to clarify all medico-nursing relationships in industry.

14. A memorandum is being drafted for submission to the International Association of Industrial Accident Boards and Commissions in the hope that that association will take favorable action on the development of uniform methods of statistical presentation of work done by the various state industrial commissions.

15. An extended discussion of medical preparedness occurred. The Council concluded that the best means for assisting the Committee on Medical Preparedness regarding industrial health which under existing circumstances gave the greatest promise of avoiding duplication of effort would be:

(*a*) To bring to the attention of the Surgeon General of the U. S. Public Health Service that

(1) The survey of physicians now being undertaken by the American Medical Association is paying direct attention to those available for service in industry.

(2) Additional information is to be sought from these same physicians about available medical facilities under their direction and about qualifications for special industrial activity.

(*b*) To request each member of the Council to submit suggestions promptly on methods of organization for effective work in the field of industrial health and that these suggestions be referred to the Committee on Medical Preparedness.

(*c*) To advocate the usefulness of field activity in relationship to medical preparedness.

16. Nominations were made and other plans laid for filling the existing vacancies in the membership of the Council.

17. A tentative program for the 1941 Congress on Industrial Health was submitted.

RADIO PROGRAM "DOCTORS AT WORK"

The winter and spring season of network radio broadcasting will be resumed by the American Medical Association in cooperation with the National Broadcasting Company over the Blue network of stations beginning Wednesday, November 13, at 10:30 to 11 p. m. eastern standard time (9:30-10 central, 8:30-9 mountain and 7:30-8 Pacific).

The program will be in dramatized form constituting the sixth successive season of dramatized broadcasting by the Association on a nationwide network. The title of the program will be Doctors at Work. The theme of the program will be the interpretation to the listener of services available in the treatment of disease and the preservation and promotion of health through the various branches of modern medicine. Thirty programs are planned dealing with different phases of medical practice, beginning with medical education, internship, residency and general practice and embracing all the major specialties in medicine and in medical phases of public health work.

The scripts will be written by William J. Murphy, director of continuity for the central division of the National Broadcasting Company, and will be under the supervision of the Bureau of Health Education with the cooperation of Miss Judith Waller, educational director, central division, National Broadcasting Company.

The evening hour assigned for these broadcasts is the most favorable hour that has ever been made available for sustaining health education broadcasts. Poster announcements of the programs have been prepared by the Bureau of Health Education. These will be sent in any reasonable quantity which can be effectively used on request from state or local medical societies and units of the Woman's Auxiliary or to health departments, schools or other educational institutions.

Titles of programs to come will be published three weeks in advance in THE JOURNAL and monthly in advance in *Hygeia*.

Comments on the program from physicians and other listeners are invited.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—The Conscription Bill, as agreed to by the Senate and the House, retains the provision providing for deferring the conscription of students, including medical students, the details of which provision were set forth in THE JOURNAL last week. The bill does not automatically defer the conscription of such students but provides that they be given a deferred status, on request. S. 3607 has passed the Senate, proposing a federal appropriation of $75,000 for the fiscal year ending June 30, 1941, and for the five succeeding fiscal years federal appropriations increased at the rate of $10,000 for each year, for use by the United States Public Health Service in conducting researches, investigations, experiments and studies relating to the cause, diagnosis and treatment of dental diseases, and to foster similar research activities by other agencies. S. 4245 has passed the Senate, authorizing the establishment of naval hospitals at the naval air stations at Jacksonville, Fla., and San Juan, Puerto Rico; the submarine base, Coco Solo, Canal Zone; the naval station, Guantanamo Bay, Cuba, and the marine barracks, Quantico, Va.

Bills Introduced.—S. 4314, introduced by Senator Hill, Washington, proposes to grant permanent total disability rating to veterans suffering from service connected tuberculosis disability if such disease remains active after two years' hospitalization. S. 4328, introduced by Senator Barbour, New Jersey, provides that no employer having contractual relations with the United States and engaged in the manufacture for or sale to the United States of supplies or equipment of any description shall discriminate against any applicant for employment suffering from a physical disability, if such applicant shall have successfully completed a course of vocational training financed or directed in whole or in part by any agency of the United States government, and shall have been certified by such agency as qualified to perform the work for which he has applied. Such physically handicapped persons, the bill provides, shall not be entitled to preference in employment but shall be considered for any vacancy on an equality with applicants who are not physically handicapped. S. 4326, introduced by Senator Sheppard, Texas, provides for continuing in the Army, Navy, Marine Corps and Coast Guard of the United States, beyond the term of their enlistment, those suffering from service connected disease or injury and in need of medical care or hospitalization until recovery through such medical care and hospitalization.

DISTRICT OF COLUMBIA

Changes in Status.—H. R. 9284 has been reported to the Senate, directing the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to practice the healing art to Dr. A. L. Ridings, formerly of Sherman, Texas. H. R. 9525 has passed the Senate, providing for the reorganization of the government of the District of Columbia.

Bill Introduced.—H. R. 10418, introduced by Representative Boland, Pennsylvania, proposes to direct the Commission on Licensure to Practice the Healing Art in the District of Columbia to issue a license to practice the healing art to Dr. Peter Florey.

WOMAN'S AUXILIARY

Alabama

The auxiliary to the Calhoun County Medical Society has held regular meetings in Anniston during the year with an average attendance of twenty-five members. Subjects discussed and speakers thereon are as follows: "Proposed Project of Establishing Prenatal Clinic," Dr. J. M. Kimmey; "The Need of an Auxiliary in Each County," Mrs. W. M. Salter; "The Story of a Doctor's Wife," Mrs. N. T. Davie; "Longevity," Dr. J. M. Kimmey, and "Socialized Medicine," Mrs. James Britton.

At a meeting of the auxiliary to the Mobile County Medical Society in Mobile, Mrs. Percy Howard spoke on "Morals of Youth." The auxiliary has as its chief project the raising of funds for the institution for the prevention of tuberculosis in children.

The Talladega County Medical Society auxiliary has met regularly in Talladega. At the March meeting Mrs. A. F. Toole read a paper on "Doctors Through the Ages." The auxiliary provides linens and garments for the Citizens Hospital at Talladega.

Missouri

At the annual meeting of the auxiliary to the Missouri State Medical Association in Joplin recently addresses were given by Dr. Nathan B. Van Etten, President-Elect of the American Medical Association, Drs. James R. McVay and Cyrus E. Burford, president and president-elect, respectively, of the Missouri State Medical Association, and Dr. Herbert L. Mantz, adviser to the auxiliary.

At recent meetings of the auxiliary to the Boone County Medical Society, speakers and their subjects were as follows: Dr. William Byrne Brown, director of the Stephens College Health Service, "Modern Trends in Medicine," and Dr. Fred McKinney, professor of psychology, University of Missouri, "Mental Health."

At a meeting of the auxiliary to the Cape Girardeau County Medical Society, Dr. A. C. Magill of State Teachers College spoke on "The Influence of Louis Pasteur on Medical Progress."

Dr. Milton D. Overholser spoke on "Laboratory Cancer Research" and Dr. Claude J. Hunt on "Effective Cancer Research" at the annual public relations meeting of the auxiliary to the Cass County Medical Society in Harrisonville.

Dr. J. C. Mulliniks spoke on "Our County Health Program" at the March meeting of the auxiliary to the Greene County Medical Society in Springfield.

Dr. R. C. Haynes spoke on "Problems Concerning the Medical Profession Today" at the March meeting of the auxiliary to the Saline County Medical Society in Marshall.

South Dakota

At a meeting of the auxiliary to the Fourth District Medical Society in Pierre recently it was voted to donate $10 to the benevolent fund of the auxiliary and to place *Hygeia* in several of the schools of the Fourth District.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ARKANSAS

First Councilor District Meeting.—The First Councilor District Medical Society will offer the following program at a meeting in Osceola, October 2:

Dr. Charles H. Lutterloh, Hot Springs National Park, Gout.
Dr. Francis Murphey, Memphis, Tenn., Ruptured Intervertebral Disk.
Dr. Oliver C. Melson, Little Rock, Differential Diagnosis of Rheumatic Affections.
Dr. Neuton S. Stern, Memphis, Acute Rheumatic Fever.
Dr. Walter T. Swink, Memphis, Etiology of Chronic Arthritis.
Dr. William C. Colbert, Memphis, Rheumatism as a Social and Economic Problem.
Dr. Joseph F. Hamilton, Memphis, Use and Abuse of Physiotherapy in Chronic Arthritis.
Dr. William C. Chaney, Memphis, Medical Treatment of Rheumatoid Arthritis.

CALIFORNIA

Extend Child Study.—The General Education Board has given $61,700 to the Institute of Child Welfare of the University of California, Berkeley, permitting the continuation and extension of studies, already under way, on the mental and physical development of school children. Under the grant, a research center was to be opened September 1, supplementing the present offices of the institute. It will contain library facilities for the use of students in the field of child development and statistical and research offices for members of the staff, graduate students and other members of the university faculty. The grant will be administered under the direction of Harold Ellis Jones, Ph.D., director of the institute, and will cover a four year program. One of the specific studies deals with the analysis of physical changes as shown by growth in height and changes in body proportions, physiologic maturing as revealed by measurements of x-rays of the bones and assessments of physical ability and efficiency based on functional tests and laboratory records of physiologic changes during exercise.

DISTRICT OF COLUMBIA

New Reportable Diseases. — New regulations have been approved in the District to aid in the control of communicable diseases, newspapers reported August 13. Under the new disease code all persons in charge of hospitals, institutions or dispensaries are asked to report a communicable disease carrier to the department within twenty-four hours after discovery. All other persons knowing of a person afflicted with a communicable disease are likewise expected to report to the department. Forty-seven communicable diseases are specified in the code as reportable. Twenty-two of these are new, it was stated. The new regulations carry a penalty for violations. They were drawn in conjunction with the public health service and have the approval of the Medical Society of the District of Columbia.

GEORGIA

Personal.—Dr. Hugh J. Bickerstaff, Atlanta, associate director in the division of maternal and child health, state department of health, has resigned to become associate professor in public health administration at the Johns Hopkins University School of Hygiene and Public Health, Baltimore. Dr. Aldean Starr Ingram, Atlanta, was to succeed Dr. Bickerstaff in the department, beginning September 1.

Changes in Health Directors. — Dr. Chester A. Hicks, formerly of Ann Arbor, Mich., has been elected commissioner of health for the district composed of Bleckley and Dodge counties, with headquarters in Eastman. According to *Georgia's Health,* the formation of this district necessitates transferring Dodge County from the Southeastern to the East Central health region. Dr. Bert H. Malone, Waycross, has resigned as medical director of the Southeastern health region, effective August 1.

ILLINOIS

Society News.—Dr. Frank Deneen, Bloomington, discussed "Management of Some Types of Nonsurgical Goiter" before the Madison County Medical Society in Edwardsville, September 6.——The Pike-Calhoun County Medical Society was recently addressed at Barry by Drs. Andy Hall Jr. on "Urinary Tract Infections"; Fred A. Kramer, "Vitamin Deficiencies and Their Relationship to the Gastrointestinal Tract," and J. William Thompson, "Surgical Management of Gastrointestinal Malignancy." All are of St. Louis.

Chicago

Dr. Oliver Appointed Professor of Dermatology.—Dr. Edward A. Oliver has been appointed professor and chairman of the department of dermatology and syphilology at Northwestern University Medical School. He succeeds Dr. Arthur W. Stillians, who was retired as of September 1 with the title professor emeritus. Dr. Oliver has been associate clinical professor of dermatology at Rush Medical College since 1927 and has been a member of the Rush faculty since 1912. He graduated at Rush in 1909. Dr. Stillians graduated at the University of Illinois College of Medicine in 1899 and has been professor of dermatology and syphilology at Northwestern since 1919.

Fellowship for Research in Rheumatic Fever. — The Chicago Heart Association, Inc., has received from the Clara A. Abbott Trust a gift of $27,000 to be added to the Memorial Fund founded in memory of Morris Fishbein Jr. The money is to be used either by itself or with other funds of the society for the study and treatment of diseases of the heart and the circulation. A fellowship is to be established in a hospital or medical school in Chicago, which will be devoted primarily to the study of the cause and treatment of rheumatic fever. The Clara A. Abbott Trust has already donated millions of dollars to the University of Chicago, to Northwestern University and to the Evanston Hospital, since the purpose of the Clara A. Abbott Trust is to aid the care of the sick and the advancement of medical science. The Memorial Fund of the Chicago Heart Association, now almost $40,000, was established in 1929 by Dr. and Mrs. Morris Fishbein at the time of the death of their son from rheumatic fever. The fund is administered by a self-perpetuating committee of five, including Drs. Robert B. Preble, Newell C. Gilbert, James B. Herrick, Walter W. Hamburger and Morris Fishbein. The officers of the society include Dr. Sidney Strauss, president; Dr. George K. Fenn, secretary, and Mr. Joseph L. Valentine, treasurer. The executive director is Mrs. Ruth McEldowney. Applications for the fellowship may be sent to the Chicago Heart Association, 203 North Wabash Avenue.

INDIANA

New Tuberculosis Hospital.—The new Southern Indiana Tuberculosis Hospital, near New Albany, was opened to patients August 19. The hospital cost $650,000 and has a capacity of 150 beds. Dr. Jerome V. Pace, New Albany, is superintendent.

District Meeting.—The Eleventh Indiana Councilor District Medical Association will meet at Manchester College, North Manchester, October 2. The speakers will include Drs. Charles R. Bird, Indianapolis, on "Medical Preparedness and Service"; Elton R. Clarke, Kokomo, "Experiences in Conducting a Baby Clinic in Private Practice," and Harold M. Trusler, Indianapolis, "Burns and Their Treatment."

Courses in Obstetrics and Pediatrics. — The Indiana State Medical Association, the Indiana University School of Medicine and the bureau of maternal and child health of the state board of health are cooperating in a series of regional postgraduate courses in obstetrics and pediatrics. One group in obstetrics opened in Kokomo, September 6, under the auspices of the Howard County Medical Society, and one in Crawfordsville, September 12, under the direction of the Montgomery County Medical Society. A series in pediatrics began in Elkhart, September 5, sponsored by the Elkhart County Medical Society.

KENTUCKY

Changes in Health Officers.—Dr. Robert L. Loftin, Pikeville, recently health officer of Pike County, has been appointed health officer of a new unit in Harrison County, with headquarters at Cynthiana.——Dr. Edward W. Kissel, Paintsville, has been named health officer of Lawrence County, with headquarters at Louisa.

Society News. — Dr. Coleman C. Johnston, Lexington, addressed the Bourbon County Medical Society, Paris, August 22, on "Changing Trends in the Problem of Peptic Ulcer."——Trigg County physicians entertained the Christian County Medical Society in Cadiz, August 20, with Drs. Burton A. Washburn Jr. and Orion Leon Higdon, Paducah, as the speakers on "Diagnosis of the Acute Surgical Abdomen" and "Diagnosis and Treatment of Ectopic Pregnancy" respectively.

LOUISIANA

New Society of Pathologists.—The Louisiana Association of Pathologists was recently formed. Included among the officers are Drs. Edwin H. Lawson, president; Bela Halpert, vice president, and Andrew V. Friedrichs, secretary-treasurer. All are from New Orleans.

Changes in Health Officers. — Dr. Louis A. Breffeilh, Shreveport, has been assigned to the Lincoln Parish health unit as director to succeed Dr. Ralph H. Allen, Ruston, who has been transferred to Amite. Dr. Breffeilh has been doing similar work in Franklin, St. Mary's Parish.

MASSACHUSETTS

Personal.—Dr. John W. Chamberlain, Belmont, has been appointed assistant director of the department of hygiene at Massachusetts Institute of Technology, Cambridge. Dr. Chamberlain has been an assistant in the department since 1937.

Dr. Kimberly Named Director of Riggs Foundation.—Dr. Charles H. Kimberly, an associate of the Austen Riggs Foundation, Inc., Stockbridge, for the last six years, has been appointed its medical director, according to the New York *Times*. He succeeds Dr. Horace K. Richardson, who resigned. Dr. Kimberly graduated at Harvard Medical School, Boston, in 1924, has served on the staffs of several hospitals and has had postgraduate study in Europe. Established by the late Dr. Austen F. Riggs, the foundation provides free treatment for needy psychoneurotic patients.

MICHIGAN

Personal.—Dr. Edwin L. McQuade, in charge of the typhoid control program in the bureau of epidemiology, state department of health, has resigned, it is reported.——Dr. Willard L. Quennell, Detroit, for twenty years superintendent of the Highland Park General Hospital, resigned to accept the superintendency of the Norfolk General Hospital, Norfolk, Va., effective September 1. He was honored at a dinner, August 14, given by members of the Highland Park Physicians Club and the staff and board of managers of the hospital and was presented with a matched set of saddle leather luggage.

Industrial Surgeons' Meeting. — The Michigan Association of Industrial Physicians and Surgeons will hold its annual meeting in Detroit, September 24, with sessions at the Harper Hospital and the Book-Cadillac Hotel. Included among the speakers will be:

Dr. Carey Pratt McCord, Detroit, Responsibility of the Industrial Physician in Time of Military Mobilization.
Dr. Alfred H. Whittaker, Detroit, History of Industrial Medicine and Surgery.
Mr. Ben E. Kuechle, vice president and general claims manager of Employers Mutual Insurance Company, Wausau, Wis., Reporting Industrial Cases to the Insurance Carrier.
Mr. Frederick G. Palliaer, deputy commissioner, Michigan Department of Labor, Medical Testimony Before the Department of Labor.
Dr. Roy D. McClure, Detroit, Anoxia in Industrial Employees.
Dr. John Ewart Caldwell, Detroit, Evaluation of Disability.
Dr. John A. Caldwell, Cincinnati, Problems in Traumatic Surgery.
Dr. Grover C. Penberthy, Detroit, Surgery of Tendons.

At the dinner Dr. Frank T. McCormick, Detroit, president, will give an address. Other speakers will include Mr. Harvey Campbell, Detroit Board of Commerce, "Responsibility of the Industrial Physicians in National Defense," and Dr. George M. Curtis, Columbus, Ohio, "The Doctor Takes a Vacation."

Committee on Scope of School Health Services.—A new committee designed to outline the scope and policy of school health services has been appointed by Eugene B. Elliott, state superintendent of public instruction, Lansing. The committee will be asked to recommend what kind and what amount of responsibility the schools should assume for health services, and to point out the implications of these health service activities for health teaching; suggest specific health service responsibilities for teachers, administrators and school health specialists, and suggest the kind of factual information and experiences in the health service area that should be included in the teachers' college curriculum. Members of the committee are:

Dr. Eldred V. Thiehoff, state department of health, Lansing, chairman.
Dr. Clarence D. Barrett, Mason, director, Ingham County health department.
Vaughan Blanchard, Detroit, director, health and physical education.
Dr. Benjamin W. Carey, Detroit, Children's Fund of Michigan.
Otto W. Haisley, Ann Arbor, superintendent of schools.
Kenneth A. Easlick, D.D.S., Ann Arbor, University of Michigan Dental School.
Dr. Rockwell M. Kempton, Saginaw.
Dr. Matthew R. Kinde, Battle Creek, Kellogg Foundation.
Mildred Marshall, teacher, Walton Township school.
Ella E. McNeil, R.N., Ann Arbor, University of Michigan.
Dr. Joseph G. Molner, Detroit, department of health.
Harold H. Wilcox, Reed City, Osceola County commissioner of schools.

The Infantile Paralysis Situation.—Quarantines imposed to prevent the spread of infantile paralysis in Dickinson and Iron counties, where numerous cases have occurred in the outbreak in the upper peninsula, were to be lifted September 13, newspapers reported. No new cases had been reported for several days, it was said. Opening of schools at Newberry in Luce County has been postponed until September 30, and at Marquette on Lake Superior schools opened September 10 after a week's postponement. Delta County schools were to remain closed until September 16. At Hastings in Barry County in the southern part of the state schools were closed September 10 for the remainder of that week, although health officials advised that closing was not necessary. It was stated that twenty-one cases had occurred in the county since January 1, five since September 1. In Lansing one classroom was closed after one pupil was found to be ill with the disease. The number of cases in the state for the month of August was 301, compared with 385 in August 1939. The state health department made available an airplane for the use of physicians in reaching patients and for transportation of patients to hospitals. Drs. Sidney D. Kramer, head of the department's virus research laboratory, Lansing, and Jerome T. Jerome, Traverse City, of its orthopedic consulting staff, went to the area to be at the call of physicians and health officers.

MINNESOTA

Medical Continuation Courses. — *Minnesota Medicine* announces a series of medical continuation courses at the Center for Continuation Study, University of Minnesota, Minneapolis, beginning with one on anesthesiology, September 23-25. Others in the group are:

Health Problems of School Children, September 26-28.
Traumatic Surgery, September 30-October 5.
Medical Therapy in General Practice, October 7-12.
General Surgery, November 4-9.
Obstetrics, November 11-16.
Proctology, November 11-16.

As enrolment is limited, those wishing to participate in the courses should register as far in advance as possible, according to the announcement. Address Dr. William A. O'Brien, University of Minnesota Hospitals, Minneapolis.

MISSOURI

Personal.—The Cole County Medical Society met jointly with dentists and druggists of Jefferson City at a picnic barbecue recently to honor four men of the three professions who had completed fifty years of service. The guests of honor were Drs. John F. Jones, Linn; William D. Townley, Chamois; Albert E. Hammen, D.D.S., Jefferson City, and Mr. Henry DeWyl, Jefferson City. Dr. Townley, whose father and grandfather were physicians, has practiced medicine in Chamois since 1879. Dr. Jones is the son of a physician; he has practiced in Linn since 1889. Dr. Hammen has practiced dentistry in Jefferson City since 1888. Mr. DeWyl, a druggist for fifty-three years, now operates a drugstore which was founded by his father, a physician.

NEW YORK

Annual District Meetings. — The annual meeting of the Third District Branch of the Medical Society of the State of New York was held at the Colonie Country Club near Albany, September 17, with the following speakers:

Dr. Walter S. McClellan, Saratoga Springs, What Has Saratoga Spa to Offer in the Field of Therapy?
Dr. Albert F. R. Andresen, Brooklyn, Gastric Hemorrhage.
Dr. Temple S. Fay, Philadelphia, Obervations on Human Refrigeration.
Dr. Charles H. Rammelkamp Jr., Boston, The Present Status of Sulfathiazole in the Treatment of Infections.
Dr. L. Whittington Gorham, Albany, Advances in the Specific Treatment of Pneumonia During the Past Year.

At the annual meeting of the Sixth District Branch at Ithaca, September 19, the speakers were:

Dr. John Maxwell Chamberlain, Oneonta, Recent Progress in Thoracic Surgery.
Dr. Benjamin P. Watson, New York, Clinical Use of Ovarian Hormones.
Dr. Colin M. MacLeod, New York, Clinical Use of the Sulfonamide Drugs.
Dr. Thomas A. C. Rennie, Baltimore, The Psychoneuroses.
Dr. Thomas A. Gonzales, New York, Sudden and Unexpected Deaths from Natural Causes.

New York City

Fund Available for Research.—The New York Academy of Medicine announces that $1,500 is available from the Louis Livingston Seaman Fund for research in bacteriology and sanitary science. The committee that administers the fund, established by the will of Dr. Seaman, will receive applica-

tions from either institutions or individuals up to October 15. The fund will be expended only in grants in aid for investigation or scholarships for research in bacteriology or sanitary science. Expenditures may be for technical help, aid in publishing original work and the purchase of necessary books or apparatus. Communications should be addressed to Dr. Wilson G. Smillie, chairman of the committee, 2 East One Hundred and Third Street, New York.

New Administration Building at Bellevue.—A new administration building for Bellevue Hospital, built at a cost of about $3,000,000, was dedicated September 11. Speakers at the ceremonies included Dr. Sigismund S. Goldwater, commissioner of hospitals; Dr. Charles D. Crandall, deputy medical superintendent, in the place of Dr. William F. Jacobs, medical superintendent, who was unable to attend; Mrs. Henry James, president of the board of managers of the school of nursing; Col. E. W. Clark, commissioner of public works for the Federal Works Agency, which contributed about $1,500,000 toward the building; and Mr. Newbold Morris, president of the city council. Besides administration offices, the building provides, among other facilities, quarters for about 250 interns, administrative offices and classrooms of the school of nursing, Episcopal, Catholic and Jewish chapels. Bellevue now has a ground area of about twelve city blocks, on which are eighteen major hospital buildings. It has eighty-nine wards, with accommodations for about 2,500 patients. In these wards 68,485 patients were cared for in 1939. There are 660 physicians on the visiting staff. The nursing division consists of 980 graduate nurses, the school of women nurses with 421 students and a school for men nurses with 122 students in a summer course.

NORTH CAROLINA

Society News.—At a meeting of the Catawba Valley Medical Society in Hickory, September 12, the speakers were Drs. George Aubrey Hawes, Charlotte, on "Traumatic Urology"; George Carlyle Mackie, Wake Forest, "Shock"; Abner M. Cornwell, Lincolnton, "Surgery of Traumatic Injuries," and James W. Davis, Statesville, "Medical Preparedness."——Dr. Louis H. Clerf, Philadelphia, addressed the Guilford County Medical Society, Greensboro, August 1, on "Clinical Significance of Hoarseness in Relation to Cancer of the Larynx."

OHIO

Annual Regional Meeting.—The ninety-sixth annual meeting of the Northwestern Ohio Medical Association will be held at Ottawa, October 1. The speakers will be Drs. Jacob Victor Greenebaum, Cincinnati, on "Status of Immunization Procedures in Infancy and Childhood"; Julien E. Benjamin, Cincinnati, "The Experience and Treatment of Pneumonias During the Past Five Years," and Fred W. Rankin, Lexington, Ky., "Cancer of the Lower Gastrointestinal Tract."

Society News.—Dr. Marion W. Coleman, Dayton, addressed the Greene County Medical Society, Xenia, August 1, on "Cystitis in Women."——Drs. Frederic G. Maurer, Lima, and Charles L. Barrett, Bellefontaine, addressed the Auglaize County Medical Society, St. Marys, August 8, on "Rheumatic Heart Disease" and "The Medical Care Plan of the Farm Security Program" respectively.——Dr. Russell L. Cecil, New York, addressed the Academy of Medicine of Cleveland, September 20, on "Present Status of Serum Therapy and Chemotherapy in the Treatment of Pneumonia."——Dr. Harold N. Cole, Cleveland, addressed the Mahoning County Medical Society, Youngstown, September 17, on "Precancerous Dermatoses and Malignancy: Diagnosis and Treatment."

Postgraduate Lectures in Various Towns.—The Ohio State Medical Association announced its third annual series of postgraduate lectures to be held in the following towns: Napoleon, Tiffin, Mansfield, Warren, Cadiz, Athens, Columbus, Wapakoneta, Lebanon and Portsmouth. Twelve lectures will be given in each town in groups of four. About twenty lecturers will present the following subjects:

The Child and His Heart.
Meningitides in Children.
Clinical Approach to the Positive Mantoux Test.
Management of Heart Failure in the Home.
The Anemic Patient.
Deficiencies and Anemia.
Practical Uses of Sulfanilamide and Its Derivatives.
Modern Treatment of Pneumonia.
Complications of the Common Cold.
Childhood Ear Infections: Proper Treatment to Prevent Deafness.
Emergency Treatment of Roadside Injuries.
Fractures and Pseudofractures of the Spine.

The series opened September 18 in some towns and will continue to December 5.

OREGON

State Medical Election.—Dr. William W. Baum, Salem, was named president-elect of the Oregon State Medical Society at the annual meeting in Eugene, September 4-7, and Dr. Karl H. Martzloff, Portland, was installed as president. Vice presidents are Drs. George E. Henton, Portland, reelected; Grover C. Bellinger, Salem, and John D. Rankin, Coquille. Dr. Morris L. Bridgeman, Portland, was reelected secretary.

PENNSYLVANIA

State Medical Meeting in Philadelphia.—The ninetieth annual meeting of the Medical Society of the State of Pennsylvania will be held in Philadelphia, September 30 to October 3, under the presidency of Dr. Charles H. Henninger, Pittsburgh, and with headquarters at the Hotel Bellevue-Stratford. Guest speakers who will address general and section meetings will be:

Dr. Tom Douglas Spies, Cincinnati, Recent Advances in Vitamin Therapy.
Dr. Richard B. Cattell, Boston, The Management of Hyperthyroidism Complicated by Other Conditions.
Dr. Howard K. Gray, Rochester, Minn., Problems Associated with Surgery of the Biliary Tract.
Dr. Francis W. White, New York, Complications Incident to Paranasal Sinusitis.
Dr. Albert D. Ruedemann, Cleveland, Headache and Head Pain of Ocular Origin.
Dr. Borden S. Veeder, St. Louis, Pediatrics in Relation to the General Practitioner.
Dr. Lawson Wilkins, Baltimore, Studies of Hypothyroidism and Dwarfism in Childhood.
Dr. Eugene F. Traub, New York, Nevi, Melanoma and Skin Cancer.
Dr. George Gilbert Smith, Boston, Total Prostatectomy for Carcinoma of the Prostate.
Dr. Frederick C. Irving, Boston, Results of Treatment of 1,000 Consecutive Cases of Preeclampsia.
Dr. Thomas B. Magath, Rochester, Minn., Hydatid Disease in North America.

Philadelphia

Society News.—At the first fall meeting of the Philadelphia County Medical Society, September 18, the guest speakers were Dr. Haven Emerson, New York, on "Public Health and the Private Practitioner" and the Rev. Alphonse M. Schwitalla, Ph.D., St. Louis, on "The Hospital and the Private Practitioner." Dr. Rufus S. Reeves, retiring president, made an address and Dr. Edward L. Bortz was installed as president.

Appointments at Temple.—Dr. Waldo E. Nelson, assistant professor of pediatrics, University of Cincinnati College of Medicine, Cincinnati, has been appointed professor and head of the department of pediatrics at Temple University School of Medicine. In the latter capacity he succeeds Dr. Thomas F. McNair Scott. Dr. Nina A. Anderson, recently resident in pediatrics at the Children's and Cincinnati General hospitals in Cincinnati, has been appointed assistant professor. Dr. John B. Bartram, resident physician at the Children's Hospital, Cincinnati, will also join the faculty at Temple.

VIRGINIA

Personal.—Dr. Francis I. Bloise, Alexandria, has been appointed chief surgeon to the state prison system on a full time basis. The full time status was authorized by the 1940 General Assembly.——Dr. John Bolling Jones, Petersburg, has been appointed a member of the state board of health.——Dr. Herbert T. Wagner Jr., recently assistant director of the Roosevelt Hospital, New York, has been appointed superintendent of the Stuart Circle Hospital, Richmond.

Special Society Elections.—Dr. Waverly R. Payne, Newport News, was elected president of the Virginia Obstetrical and Gynecological Society at the annual meeting, which was held during the joint meeting of the state medical societies of Virginia and West Virginia at White Sulphur Springs, W. Va., in July. Drs. Andrew M. Groseclose, Roanoke, and Henry C. Spalding, Richmond, are vice president and secretary, respectively. Dr. John M. Bishop, Roanoke, was elected president of the Virginia Pediatric Society at the same time; Drs. Emily Gardner, Richmond, and Edwin A. Harper, Lynchburg, were elected vice president and secretary, respectively. Dr. Henry H. Wescott, Roanoke, was elected president of the Virginia Orthopedic Society and Dr. Bernard H. Kyle, Lynchburg, was reelected secretary. Officers of the Virginia Radiological Society elected were Drs. Wright Clarkson, Petersburg, president; Clayton W. Eley, Norfolk, vice president, and Charles H. Peterson, Roanoke, secretary. Officers elected by the Virginia Urological Society are Drs. Samuel B. Cary, Roanoke, president; Linwood D. Keyser, Roanoke, vice president, and Charles M. Nelson, Richmond, secretary.

WASHINGTON

State Medical Election.—Dr. George W. Cornett, Yakima, was named president-elect of the Washington State Medical Association at the annual meeting in Tacoma and Dr. Homer D. Dudley, Seattle, was installed as president. Dr. Lyle A. Greenwood, Bellingham, was elected vice president and Dr. Vernon W. Spickard, Seattle, was reelected secretary. The 1941 convention will be held in Seattle.

WEST VIRGINIA

Society News.—A symposium on syphilis was presented at a meeting of the Cabell County Medical Society, Huntington, August 8, by Drs. Ray M. Bobbitt, Boyd F. Brown and Edward F. Reaser. —— Drs. Martin L. Bonar and Pat A. Tuckwiller, Charleston, addressed the Central West Virginia Medical Society, Webster Springs, August 21, on "Skin Manifestations of Internal Disorders" and "The Anxiety Tension State" respectively.

GENERAL

Fellowship for Research with Electron Microscope.—The National Research Council recently announced a new fellowship in electron microscope research established by the RCA Manufacturing Company for work to be carried on in the company's laboratories at Camden, N. J. It was announced that preference would be given "to versatile young men of United States citizenship, who have sound training in microbiology, a doctor's degree (Ph.D. or M.D.) and a record of original work." Applications are to be sent to the division of biology and agriculture, National Research Council, Washington, D. C.

American Public Health Association.—The sixty-ninth annual meeting of the American Public Health Association will be held in Detroit, October 6-11, under the presidency of Dr. Edward S. Godfrey Jr., Albany, N. Y., commissioner of health of New York State. Among addresses to be given in general and in section meetings will be the following:

Dr. John R. Paul, New Haven, Conn., Rheumatic Fever—Factors in Its Occurrence.
Dr. Clarence D. Selby, Detroit, The Renaissance of Industrial Hygiene.
Dr. Cyrus C. Sturgis, Ann Arbor, Mich., Some Important Factors in the Etiology of the Anemias.
Dr. John B. Youmans, Nashville, Tenn., An Assessment of the Nutrition of a Rural Population in Tennessee.
Dr. Richard E. Shope, Princeton, N. J., The Silent Intermediate Host Reservoir as Exemplified in Bovine Pseudo-Rabies and Swine Influenza.
Dr. Julius H. Hess, Chicago, Essentials in the Care of Premature Infants.
Dr. Everett D. Plass, Iowa City, Organization, Supervision and Objectives of Prenatal Medical Supervision: Are They Being Met by the Average Prenatal Clinic?
Dr. Henry E. Meleney, Nashville, Tenn., The Recent Extension of Endemic Typhus Fever in the United States.
Dr. Frank L. Horsfall Jr., New York, The Present Status of Knowledge Concerning Influenza.
Dr. George Baehr, New York, Public Health Importance of the Intravenous Drip Method for Treatment of Syphilis.

At a special session Wednesday afternoon, October 9, on "The Control of Venereal Diseases in a National Defense Program" Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, Washington, D. C., will preside and speakers will include Major Gen. James C. Magee, Surgeon General, U. S. Army, and Rear Admiral Ross T. McIntire, Surgeon General, U. S. Navy, on the relationship of the health of civilians to the efficiency of their respective services. Dr. Waller S. Leathers, Nashville, Tenn., will be installed as president and will speak on "Public Health in National Defense." Henry F. Vaughan, Dr.P.H., Detroit, will give the second annual Delta Omega Lecture on "The Way of Health." The seventh Institute on Public Health Education will be held on Sunday October 6. Among speakers at general sessions will be Drs. William W. Bauer, director of the Bureau of Health Education, American Medical Association, Chicago, on "The Philosophy of Public Health Education," and Charles V. Akin, Washington, D. C., "The Status of Public Health Education."

Instruction in Nursing of Patients with Infantile Paralysis.—The National Foundation for Infantile Paralysis has published a pamphlet, "Nursing Care of Patients with Infantile Paralysis," by Jessie L. Stevenson, R.N., consultant in orthopedic nursing, National Organization for Public Health Nursing, New York. It is illustrated with line drawings showing various positions for the patient, apparatus and appliances for use in the acute stage and in convalescence. It was prepared by the public health nursing organization as a part of a project in orthopedic nursing sponsored by the foundation and is intended to assist the public health nurse and others responsible for home care of patients with infantile paralysis during and following an epidemic. Copies are available free on request. Address the National Foundation for Infantile Paralysis, 120 Broadway, New York.

Meeting of Obstetricians, Gynecologists and Abdominal Surgeons.—The fifty-third annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons will be held at The Elms, Excelsior Springs, Mo., September 26-28, under the presidency of Dr. James R. McCord, Atlanta, Ga. Dr. Ernst James Heyman of Radiumhemmet and also docent in obstetrics and gynecology at the Caroline Institute in Stockholm, Sweden, will deliver the Joseph Price Oration. Dr. Erwin O. Strassmann, Houston, Texas, has received the association's Foundation Prize and will present his thesis on "The Theca Cone and Its Tropism Toward the Ovarian Surface, a Typical Feature of Growing Human and Mammalian Follicles." Among other speakers will be:

Dr. Frederick H. Falls, Chicago, A Skin Reaction for the Diagnosis of Pregnancy.
Dr. Charles O. McCormick, Indianapolis, The Effect of Obstetrical Anesthesia on the Newborn Infant.
Dr. Clifford B. Lull, Philadelphia, Pubertas Praecox Due to Ovarian Tumors.
Dr. David Hadden, Berkeley, Calif., Clinical Experience with Testicular Extract in Obstetrics and Gynecology.
Dr. William A. Coventry, Duluth, Minn., Actinomycosis of the Ovary.
Dr. Frank R. Smith, New York, Nativity and Carcinoma of the Cervix.

Conference on Tuberculosis. — The Mississippi Valley Conference on Tuberculosis and the Mississippi Valley Sanatorium Association will meet at the Lowry Hotel, St. Paul, October 2-4. The program will include an x-ray conference, presided over by Dr. John H. Skavlem, Cincinnati, and the following papers:

Dr. Jack Sanford Kruglick, Chicago, A Nationwide Survey of Food Handlers and Infections.
Drs. William M. Kinney, Joplin, Mo., and Jesse E. Douglass, Webb City, Silicotuberculosis in Missouri.
Dr. George McL. Waldie, Ishpeming, Mich., Industrial Clinic Examinations.
Dr. James D. Adamson, Winnipeg, Man., Canada, Examination of the Lungs in Recruits.
Drs. Carl C. Birkelo and Bruce H. Douglas, Detroit, The 4 x 5 Film in Case Finding.
Dr. David O. N. Lindberg, Decatur, Ill., Relative Usefulness of 35 Mm. Films in Case Finding.
S. Reid Warren Jr., Moore School of Engineering, Philadelphia, Comparative Value of Chest Roentgenograms Made on Films and on Paper.
William H. Feldman, D.V.M., and Dr. Archie H. Baggenstoss, Rochester, Minn., The Detection of Tubercle Bacilli in Latent Lesions and in Normal Tissues of the Human Lung.
Dr. Herman E. Hilleboe, St. Paul, Tuberculosis in Public Institutions.

The Minnesota Public Health Association will hold its annual meeting in conjunction with the conference.

American Roentgen Ray Society.—The forty-first annual meeting of the American Roentgen Ray Society will be held at the Hotel Statler, Boston, October 1-4. At his installation as president of the society, Dr. Merrill C. Sosman, Boston, will speak on "Specialization in Roentgenology." According to the preliminary program there will be symposiums on diagnosis and treatment of carcinoma of the larynx; classification, treatment and prognosis of carcinoma of the thyroid; unusual forms of pulmonary disease; unusual gastrointestinal lesions and unusual sources of gastrointestinal hemorrhage. Miscellaneous topics will include:

Dr. Robert Drane, Savannah, Ga., An Unusual Intracranial Foreign Body.
Drs. George M. Wyatt and Sidney Farber, Boston, Neuroblastoma.
Dr. Karl Kornblum, Philadelphia, Polyostotic Fibrous Dysplasia.
Dr. Barton R. Young, Philadelphia, Body Section Roentgenography (Planigraphy) in Diseases of the Respiratory Tract.
Dr. Cornelius G. Dyke, New York, Cranial Laminagraphy.

Dr. George W. Holmes, Boston, will receive the Caldwell Medal, Tuesday evening, following his delivery of the Caldwell Lecture on "The Development of the Science of Roentgen Technic." Gerry B. Schnelle, D.V.M., Boston, will deliver a clinical lecture on "Roentgen Rays in Veterinary Medicine" Wednesday afternoon.

LATIN AMERICA

Vital Statistics in Uruguay.—Forrest E. Linder, of the staff of the division of vital statistics of the Bureau of the Census, U. S. Department of Commerce, Washington, D. C., recently assisted the government of Uruguay to organize a statistical office in the ministry of public health. Transcript forms were prepared for civil mortality records, coding and tabulating procedures were developed and a manual of instructions for clerks was written, according to the *Registrar*, the bulletin of the census bureau. Mr. Linder made the trip as consulting statistician of the Pan American Sanitary Bureau. He visited also health agencies in Peru, Argentina, Brazil and Haiti.

Society News.—The First Brazilian Congress of Gynecology and Obstetrics was to be held in Rio de Janeiro, September 8-15. Subjects to be discussed were recent advances in gynecologic hormonology, diagnosis and treatment of cervical cancer, endocrinopathy in obstetrics and social aspects of obstetric assistance.——The second Latin American Congress of Criminology will be held in Santiago, Chile, Jan. 19-26, 1941, under the auspices of the University of Chile and the Institute of Penal Science. Among the subjects of medical interest to be discussed will be blood groups and their importance in criminology, classification of mental diseases with relation to their medicolegal importance, eugenics and criminology, psychoanalysis and criminology.

FOREIGN

Joseph Meister Dies.—Joseph Meister, the first person to receive the antirabies treatment from Pasteur in 1885, is reported to have committed suicide in Paris. Meister became Pasteur's assistant at the Pasteur Institute and after the scientist's death remained there as a guard.

CORRECTION

Superior Pulmonary Sulcus Tumor.—In the editorial "The Superior Pulmonary Sulcus Tumor of Pancoast" in THE JOURNAL, August 24, page 617, reference 5 in small type at the bottom of the second column should read: Steiner, P. E., and Francis, B. F.: Primary Apical Lung Carcinoma, *Am. J. Cancer* **22**:776 (Dec.) 1934.

Government Services

Army Personals

Col. James E. Baylis, Medical Corps, U. S. Army, who for the last year has been executive officer in the Surgeon General's Office, was relieved of that assignment September 1 and ordered to Atlanta, Ga., where he will become corps area surgeon. The new executive officer in the Surgeon General's Office will be Col. Larry B. McAfee, who previously was executive officer at the Fitzsimons General Hospital, Denver. He will be succeeded by Col. Omar H. Quade.

Dr. Neal Made Chief of Division of Industrial Hygiene

Dr. Paul A. Neal, surgeon, U. S. Public Health Service, and a member of the staff of the National Institute of Health, Bethesda, Md., has been detailed as chief of the division of industrial hygiene of the institute, according to a recent release from the public health service. He succeeds Dr. Royd R. Sayers, who went to the bureau of mines several months ago. Dr. Neal, who is 39 years of age, graduated at Vanderbilt University School of Medicine, Nashville, in 1927.

Changes in Bureau of Animal Industry

The biochemical division of the Bureau of Animal Industry of the U. S. Department of Agriculture has been merged with the pathologic division and the animal nutrition division. The position of chief of the biochemical division has not been filled since the recent death of Robert M. Chapin. Activities of the division relating to animal diseases were transferred to the pathologic division and those relating to the nutritive value of animal products were assigned to the animal nutrition division at the Beltsville Research Center, Beltsville, Md.

Medicomilitary Training Course for Reserve Officers

The twelfth annual inactive status training course for medical department reserve officers of the U. S. Army and Navy will be held at the Mayo Foundation, Rochester, Minn., October 6-20. As in former years, special work in clinics and hospitals will be offered during the morning hours for those asking special assignments. Presentations of selected subjects in military medicine are scheduled. There will be appropriate sections or special courses for officers of the dental and veterinary corps. All medical department reserve officers on the active list are eligible for enrolment. Approved applicants will be enrolled on the recommendation of the surgeon of the seventh corps area or the surgeon of the ninth naval district. Applications should be made at an early date and should be forwarded through the respective reserve headquarters of the officers concerned.

Navy Personals

Capt. Dallas G. Sutton, Medical Corps, U. S. Navy, has been ordered to duty in command of the Naval Medical School in Washington. Capt. Luther Sheldon Jr. has been ordered to duty as assistant chief of the bureau of medicine and surgery. Capt. William Chambers has been relieved from command of the Naval Medical School and ordered to command the hospital and school at San Diego, relieving Capt. Edward U. Reed, who goes to duty as medical officer of the twelfth naval district. Capt. George S. Hathaway was relieved from duty at the naval hospital in Newport and ordered to the Marine Corps base in San Diego.

Government Needs Medical Officers

The government needs medical officers. On August 5 the Civil Service Commission announced an examination for three grades of medical officer positions, ranging in salary from $3,200 to $4,600 a year, for a number of defense agencies as follows:

Public Health Service
Food and Drug Administration
Veterans Administration
Civil Aeronautics Authority
Indian Service

The examination includes fourteen different optional branches of medicine, giving opportunities to appointees to advance in their chosen specialty. Applicants will not be required to report for an assembled written test but will be rated on their sworn statements regarding their education, experience and fitness, subject to corroborative evidence. Applicants must have been graduated with an M.D. degree from a recognized medical school and must have had professional experience in one of the following optional branches:

1. Aviation medicine
2. Cardiology
3. Dermatology
4. Eye, ear, nose and throat (singly or combined)
5. General practice
6. Industrial medicine:
   (*a*) Gas analysis or toxic dust
   (*b*) General
7. Internal medicine and diagnosis
8. Medical pharmacology
9. Neuropsychiatry
10. Pathology, bacteriology and roentgenology (singly or combined)
11. Public health:
    (*a*) General
    (*b*) Venereal
12. Surgery:
    (*a*) General
    (*b*) Orthopedic
    (*c*) Chest
13. Tuberculosis
14. Urology

For some positions in the Veterans Administration, applicants for positions of associate medical officer paying $3,200 a year need not have had experience other than one year of internship.

The commission is finding it difficult to obtain enough qualified applicants for this examination. Applications will be received until further notice. The filling of these positions is of the utmost importance to the success of the national defense program, and physicians who are able to meet the announced requirements are urged to apply.

An examination has also been announced for two classes of junior medical officer positions paying $2,000 a year (the one rotating internship, the other psychiatric resident positions) at St. Elizabeths Hospital, Washington, D. C. For the rotating internship positions applicants must be fourth year students in a class A medical school, but before entrance on duty they must furnish proof that they have successfully completed, prior to June 1941, a four year course in such a school. For the psychiatric resident positions applicants must have completed their fourth year of study in a class A medical school subsequent to Dec. 31, 1937, and must have a degree of B.M. or M.D. Before entrance on duty they must show that they have successfully completed an accredited rotating internship of at least one year. The closing date for receipt of applications is October 17 for states east of Colorado and October 21 for Colorado and states westward.

The requirements for all these positions are explained in detail in the examination announcements, which, with the application forms and further information, may be obtained from the secretary of the Board of U. S. Civil Service Examiners at any first or second class post office or from the U. S. Civil Service Commission, Washington, D. C., or from any of the commission's district offices.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 11, 1940.

Medical Service in Factories Made Compulsory

An order is to be made by the minister of labor which will require arrangements to be made in any named factory for part or whole time physicians, nurses and officers to supervise the welfare of the employees. The general council of the Trade Union Congress has welcomed the proposal as the beginning of a factory and welfare service. The council thinks that it might be extended so as to establish the principle of a state medical service.

Government to Pay Civilians for War Injuries

Air attacks have brought civilians into the same danger from air attack as soldiers and so the government has made similar arrangements both for the treatment of casualties and for payments for disablement from injury. The scheme for civilians applies to members of civil defense organizations injured while on duty and to all other civilians who depend on their earnings for a livelihood. It also applies to immediate dependents if the war injury is fatal. The grants in respect to injury are (1) a temporary injury allowance if the injury causes incapacity for work for not less than seven days; (2) a pension with family allowances if the injury results in serious or prolonged disablement. The temporary injury allowance for a married man is $8 a week, for a single man $5, for a woman $4.50. Pensions for serious or prolonged disablement will be at the same rates as in the fighting services. For permanent disablement a man will receive $8 a week, a woman $6.

Our Health After Nearly a Year of War

In the *Sunday Times* Lord Horder takes stock of the health of the nation after nearly a year of war. While war is an evil thing, he thinks it has done good, like a hormone, in "activating the whole chemistry of the nation." It has had an accelerating effect on efforts we were making to improve the condition of the people. As far as physical health is concerned, Lord Horder finds that it has kept at an unusually high level. The comparative mildness of last winter's influenza epidemic was a blessing. Cerebrospinal fever, an epidemic hazard of wartime, though it showed itself in the early part of this year, died down quickly and chemotherapy reduced its fatality to an unprecedented level. None of the common infectious diseases attained serious dimensions. Tuberculosis has shown no material increase, and even "the camp follower of war," venereal disease, has not got out of hand. Deficiency diseases have not bothered us. For the control of all these plagues the intensified activity of the health services may take no small credit. The evacuation of children from the danger areas, concerning which so many fears were anticipated, was, from the health angle, a huge success. Compared with the previous year the incidence of diphtheria and scarlet fever fell to two thirds of that in 1938 and poliomyelitis to just over one third. The children benefited enormously in health.

This satisfactory condition of our national health Lord Horder ascribes much more to the increasingly favorable conditions of the people during the years preceding the war than to the care exercised during it. The contrast with Germany is marked. Dr. Gumpert, the author of "Heil Hunger," summarizes the results of six years of Nazi rule as "an increased death rate, a falling birth rate, growing criminality, an increase in drunkenness, venereal disease, tuberculosis, food poisoning and a doubling of mental disease." Gumpert considers Nazi rule "the most unwholesome political system ever born in the brain of man." In physique we are far better prepared than was the enemy at the outset of war and we have kept well ahead of him. But now comes the testing time. Vigilance in health must include the worker as well as the fighter. That this is already apparent to the mind of the minister of health is shown by his memorandum on "Hours of Work and Maximum Output" and his exercise of emergency powers with regard to medical supervision of factories and the first aid and welfare services connected with them. The vital question of fatigue is being carefully watched.

WHERE BRITAIN LAGS

But, says Lord Horder, we must watch our national vices and repent of them in time. "We British are not scientifically minded; we pay lip service to research but are not really interested; method is not one of our national characteristics. Perhaps nature has spoilt us; anyway, in the absence of a strong incentive we are casual and lazy minded and we have left for a long time entirely unimplemented many of the discoveries that science hands out to us." As an example he gives neglect of immunization against diphtheria. It is some years since the principles of diet which underlie nutrition were established. Yet they are only beginning to be reflected either in the food of the people or in the kind of foodstuffs that the country produces. Now comes "total war" and so we must be efficient. We inquire how this is to be done and ask questions the answers to which have been shouted for years into deaf ears. We are turning to the experts and saying "Come, do your stuff; we need you." To their credit the experts do not resent our neglect and fail us. "Let a future generation say of this that it won the war because it realized the importance of guns *and* butter."

The Closing of the Burma Road and the Chinese Red Cross

The Chinese ambassador in London has received a telegram from Dr. Robert Lim, the distinguished pathologist and director of the Chinese Red Cross Medical Relief Commission, asking him to appeal to the British Red Cross, the British churches and the British government to exempt Chinese Red Cross equipment, supplies, vehicles and fuel in Burma from all restrictions in accordance with the spirit of the Geneva convention. If the passage of vehicles and fuel for medical relief is prohibited, the Chinese Red Cross will be deprived of all means of transporting medical material to the interior or running its ambulances. It may be remembered that the British government, under Japanese pressure at this critical time, consented to close the Burma road to the passage of munitions of war for three months, the suggestion being made that such closure would facilitate peace negotiations.

Dr. Hingston Fox, Balneologist

Dr. Hingston Fox, a leading balneologist, has died in his eighty-second year. Of Quaker stock he was the sixth in an unbroken line of physicians, the medical tradition of which is still preserved. His elder brother Richard Hingston Fox was, like him, a fellow of the Royal College of Physicians and was the medical historian of the Hunterian Society and author of "Dr. John Fothergill and his Friends." All his six brothers were physicians and also his son and daughter. Educated at the London Hospital, he specialized early in balneology, which he began to practice at Strathpeffer Spa in Scotland. On this he wrote a handbook and guide, "Strathpeffer Spa, its Climate and Waters." Eventually he settled in London, where he succeeded Sir Hermann Weber as the leading balneologist. He played a prominent part in the physical treatment of soldiers and sailors of the war of 1914-1918 who suffered from chronic arthritic complaints. He was honorary president of the Ligue internationale contre le rheumatisme and the founder and editor of the *Archives* of the International Society of Medical Hydrology and Climatology. He also wrote the "Principles and Practice

of Medical Hydrology," "Outlines of Medical Hydrology," "Physical Remedies for Disabled Soldiers" and "The Causation and Treatment of Chronic Rheumatism" (with Jan van Breemen of Amsterdam). A great pioneer of physical therapy, he experienced much of the disappointment of the reformer in a world which will not share his enthusiasms.

BUENOS AIRES

(From Our Regular Correspondent)

Aug. 16, 1940.

Vitamin A Deficiency in Vascular Diseases

The question of vitamin A deficiency in vascular diseases was investigated in Buenos Aires by Prof. Dr. Mariano R. Castex in collaboration with his assistants Prof. Dr. Alfredo V. Di Ció and M. Schteingart, who made a report to the National Academy of Medicine. The vitamin A and the provitamin (carotene) contents were determined according to Linquist's technic in the blood serum of twenty-eight patients with vascular diseases and were compared with the normal values. In one half of the cases with intermittent claudication there existed a noticeable A hypovitaminosis of various degrees. Carotene underwent similar changes but in a smaller percentage. The results were even more noticeable in persons with gangrene of the lower extremities; in eight of these, only one had a normal value in the serum with the same proportionate reduction in carotene. The relationship of these changes to the vascular disease are not explained as yet.

Ulcerative Colitis and Spirochetes

The problem of colitis ulcerosa and spirochetes was investigated by Prof. Carlos Bonorino Udaondo, director of a large research laboratory in Buenos Aires, who reported the investigations in the *Archivos argentinos de enfermedades del aparato digestivo y de la nutrición.* Spirochetes are found in the stools of normal persons more frequently in tropical than in other regions of the globe. Whereas the diplostreptococcus of Bargen is found in numerous cases of chronic ulcerative colitis, the pathogenic character of spirochetes in the same disease is not as definitely established. It is assumed that the saprophytic spirilla of the saliva are swallowed and in the intestine, at sites which are already otherwise diseased, they become pathogenic; thus there are amebospirillar dysenteries and dysenterospirillar dysenteries. Among sixteen cases of ulcerative colitis there were seven in which the so-called diplostreptococcus and two in which Spirochaeta eurygyrata (Werner) was isolated. Oral and parenteral arsenic therapy, without other special treatment, produced cure within a few days. The spirilla, which previously were found practically in pure culture deep in the ulcerations, had disappeared. The value of this procedure is proved by a control case in which the arsenic therapy was unsuccessful, since few or no spirochetes were present.

Brief Items

In the early part of 1941 the second inter-American congress for endocrinology will be held in Montevideo (Uruguay), as had been decided at the first one in Rio de Janeiro. Dr. Juan C. Mussio Fournier, minister of public health, will be the chairman. All directors and deans of the faculties of medicine of American universities have been invited.

In Córdoba, provincial capital in northern Argentina, a cancer institute will be erected, for the construction of which 600,000 pesos ($178,620) has been made available by the government.

Deaths

Prof. Carlos G. Malbrán died in Buenos Aires on August 1. He had made extensive bacteriologic and hygienic studies under Pettenkofer, Koch and Behring in Germany and under Roux in France. He was the first who held the chair for bacteriology in Buenos Aires; he was president of the health department of Argentina and held other important offices. In 1899 he combated plague in Paraguay and introduced the organization for the control of leprosy in Argentina. He also did valuable work in the campaign against malaria.

Prof. Dr. Eduardo Rabello, a well known dermatologist, died in Rio de Janeiro, August 8. He was a member of the International Leprosy Committee, of the International League Against Venereal Diseases and founder and director of the Foundation Gaffrée Guinle. He also studied and published books on ancylostomiasis, dermatomycosis, leishmaniasis and syphilis.

Marriages

ELLIS DUNCAN JR., Louisville, Ky., to Miss Marie Ernst Walmsley of Brooklyn at Falmouth, Mass., August 24.

FRED DAWSON REYNOLDS to Miss Violet Opal Barnett, both of Montgomery, Ala., at Memphis, Tenn., August 25.

JAMES BARCLAY DONALDSON, Jackson, Miss., to Miss Elizabeth Ann Gartner at Columbia, Tenn., August 21.

JAMES STERLING RUFFIN JR., Knoxville, Tenn., to Miss Kathryn Witherington of Covington, August 20.

FRANCIS CLABURN MCLANE, Calhoun Falls, S. C., to Miss Mary Bowers Kinsey at Walterboro, August 10.

ANGELO WALTER BENJAMIN THEOBOLD CIANI, Iowa City, to Miss Ruth Bowman of Guttenberg, August 24.

VICTOR F. WOLDMAN, Cleveland, to Miss Carolin Mahler Heller of Cleveland Heights, Ohio, August 8.

JEAN KRUMRINE FIELD, Aliquippa, Pa., to Bernard Otis Black, D.D.S., of Toledo, Ohio, June 15.

ALBERT ERNEST RATH, Wooster, Ohio, to Miss Dorothy Paisley Snure of Lakewood, August 16.

TRAVIS SMITH, Winters, Texas, to Miss Mary Katherine Lewis of Houston at Temple, June 23.

JOHN AMOS CONLEY, Wilmette, Ill., to Miss Marie Natalie Cashatt at High Point, N. C., in June.

ALBERT ARCHER PARRISH to Miss Annie Marie McAdams, both of Durham, N. C., August 16.

JAMES W. TANKARD, Hilton Village, Va., to Miss Eileen Looney of Jenkins, Ky., in August.

MARCUS A. PIERSON JR., Galveston, Texas, to Miss Gladys Daly of Opelousas, La., in August.

W. VINCENT MEYER, Everett, Wash., to Miss Dorothy Gilmore of Butte, Mont., June 22.

LESLIE M. CHAFFEE, Coupeville, Wash., to Miss Edna Vander Stoep of Oak Harbor, June 24.

JOSEPH S. SKOBBA, to Miss Hope Toman, both of Indianapolis, in Fort Wayne, Ind., August 1.

WILLIAM H. HOLLINSHEAD, Minneapolis, to Miss Mary Waddell of St. Paul, July 16.

ERNEST C. ASBURY, New Baden, Ill., to Mrs. Josephine L. Asbury of O'Fallon recently.

WELDON P. CHANDLER, Asheville, N. C., to Miss Athylene Briggs of Mars Hill in June.

WALTER LEWINNEK, Mason City, Ill., to Miss Beryl Nelson of Antigo, Wis., August 12.

THOMAS N. MEADE, Goldendale, Wash., to Miss Roselia Turley of Yakima, June 22.

LAWRENCE H. MILLER, Bradford, Pa., to Miss Ann Thompson of Wilkinsburg, June 15.

HERMAN HINDIN, Ritzville, Wash., to Miss Virginia Larse of Wenatchee, June 17.

HOMER B. GABLE, Monticello, Ind., to Mrs. Helen Bennett of Logansport, August 7.

JOHN JOSEPH FRANCIS to Miss Lidie Shaw, both of Nashville, Tenn., June 20.

CREIG S. HOYT JR., Grove City, Pa., to Miss Ruth E. Houk, June 18.

NED B. GRINER, Circleville, Ohio, to Miss Mary Agnes Thaw in June.

RODNEY B. HEARNE to Miss Dorothy Leede, both of Seattle, July 3.

Deaths

Robert G. Sayle, Milwaukee; Rush Medical College, Chicago, 1885; member of the State Medical Society of Wisconsin; fellow of the American College of Surgeons; past president of the Milwaukee County Medical Society; for many years on the staff of the Wisconsin College of Physicians and Surgeons and the Marquette University School of Medicine as instructor of anatomy, surgical anatomy and clinical surgery; surgeon to the Milwaukee, Milwaukee Children's, Johnston Emergency, and Deaconess hospitals; aged 80; died, August 1, of coronary occlusion.

Oscar Addison Mack McKimmie, Washington, D. C.; Columbian University Medical Department, Washington, 1891; member of the Medical Society of the District of Columbia; formerly clinical professor of laryngology and otology at the George Washington University School of Medicine; fellow of the American College of Surgeons; aged 72; attending surgeon to the Episcopal Eye, Ear and Throat Hospital, where he died, August 7, of uremia and cardiovascular renal disease.

Virgil Ernest Dudman ✠ Portland, Ore.; Northwestern University Medical School, Chicago, 1914; associate clinical professor of obstetrics and gynecology and formerly instructor at the University of Oregon Medical School; fellow of the American College of Surgeons; president of the Emanuel Hospital; on the gynecology staff of the Multnomah Hospital; on the visiting staff of St. Vincent's Hospital; aged 55; died, August 5, of subacute bacterial endocarditis.

Forbes Hawkes ✠ New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1891; member of the American Urological Association; fellow of the American College of Surgeons; consulting surgeon to the Presbyterian and Flower and Fifth Avenue hospitals, New York, Flushing (N. Y.) Hospital, Nassau Hospital, Mineola, St. Joseph's Hospital, Far Rockaway; aged 74; died, August 24, of coronary thrombosis.

Floyd Jerome Atwell ✠ Cooperstown, N. Y.; Albany (N. Y.) Medical College, 1907; member of the House of Delegates of the American Medical Association, 1937-1938; served during the World War; secretary of the Otsego County Medical Society; was town and village health officer; on the staff of the Mary Imogene Bassett Hospital; aged 55; died, August 24, of embolism following an operation for appendicitis.

Numa Pompilius Garfield Adams, Washington, D. C.; Rush Medical College, Chicago, 1924; dean since 1929 and professor of medicine since 1930 at the Howard University College of Medicine; at one time a member of the staff and director of the heart clinic at the Provident Hospital, Chicago; aged 55; died, August 29, in the Albert Merritt Billings Hospital, Chicago, of pneumonia following an operation.

Mary Elizabeth Halsall, Winthrop, Mass.; Tufts College Medical School, Boston, 1903; member of the Massachusetts Medical Society; aged 75; on the courtesy staff of the Winthrop Community Hospital, Chelsea (Mass.) Memorial Hospital, Whidden Memorial Hospital, Everett, and the New England Hospital for Women and Children, Boston, where she died, August 1, of bronchopneumonia.

Ralph Waldo, Westhampton, N. Y.; University of the City of New York Medical Department, 1882; fellow of the American College of Surgeons; consulting gynecologist to the Lebanon and Jewish Maternity hospitals, New York, Nyack (N. Y.) Hospital, Rockaway Beach (N. Y.) Hospital and the Southampton (N. Y.) Hospital; aged 79; died, August 6, of arteriosclerotic heart disease.

Robert Warren Miller ✠ Los Angeles; College of Physicians and Surgeons, Keokuk, Iowa, 1876; Bellevue Hospital Medical College, New York, 1887; past president of the Los Angeles County Medical Society; for many years on the staffs of the California Hospital and the Methodist Hospital; aged 90; died, August 6, of cerebral hemorrhage.

Mary Jeannette Kearsley ✠ Chicago; Woman's Medical College, Chicago, 1888; past president of the Aux Plaines branch of the Chicago Medical Society; formerly on the staff of the Women's and Children's Hospital; for many years on the staff of the West Suburban Hospital, Oak Park, Ill.; aged 73; died, July 7, of coronary thrombosis.

Zebud MacKay Flinn, Prescott, Ariz.; Dalhousie University Faculty of Medicine, Halifax, N. S., Canada, 1932; served with the Canadian Army in the Royal Flying Corps during the World War; aged 41; died, August 3, in the Presbyterian Hospital, San Juan, Puerto Rico, of spontaneous subarachnoid hemorrhage.

Jacob Myer Berris, Detroit; Detroit College of Medicine and Surgery, 1917; member of the Michigan State Medical Society; assistant instructor in clinical medicine at the Wayne University College of Medicine; for many years on the staff of the Grace Hospital; aged 44; died, August 8, of coronary thrombosis.

Henry William Morsch ✠ Woodhaven, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1904; on the staffs of the Lutheran and Bushwick hospitals, Brooklyn; aged 57; died, July 30, in the New York Post-Graduate Hospital of coronary occlusion and prostatectomy.

Henry Levi Davis, Rockford, Ill.; St. Louis University School of Medicine, 1906; member of the Illinois State Medical Society; veteran of the Spanish-American War; aged 61; died, August 6, in St. Anthony Hospital of perforation of the esophagus and aorta due to a chicken bone which he swallowed.

James Meade Atkinson ✠ Eaton, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1893; on the staff of the Ball Memorial Hospital, Muncie, and the Blackford County Hospital, Hartford City; aged 77; died, August 12, of coronary occlusion.

Samuel Milton Wendt ✠ Chehalis, Wash.; Minneapolis College of Physicians and Surgeons, medical department of Hamline University, 1897; at one time health officer of Kittitas County; on the staff of St. Helen's Hospital; aged 68; died, August 1, of coronary disease.

Arno Edward Bohm, Akron, Ohio; University of Wooster Medical Department, Cleveland, 1907; member of the Ohio State Medical Association; served during the World War; aged 60; on the staff of the People's Hospital, where he died, August 12, of myocarditis.

Hubert Thomas Elders ✠ Lieutenant, M. C., U. S. Army, Columbia, S. C.; Medical College of the State of South Carolina, Charleston, 1936; was commissioned a first lieutenant in the regular army in 1938; aged 33; was killed, August 18, in an airplane accident.

Wilson Randolph ✠ Detroit; Detroit College of Medicine, 1906; formerly associate professor of ophthalmology at his alma mater; fellow of the American College of Surgeons; on the staff of St. Mary's Hospital; aged 62; died, August 2, of coronary thrombosis.

Boney Wells Page ✠ Trenton, N. C.; Medical Department of Tulane University of Louisiana, New Orleans, 1909; first rural whole time health officer in North Carolina in Lumberton, Robeson County, from 1912 to 1917; aged 63; died, August 1, of heart disease.

Daniel Andrew Nolan ✠ Middletown, Conn.; Medico-Chirurgical College of Philadelphia, 1895; served during the World War; on the staff of the Middlesex Hospital; aged 68; died, August 2, of cerebral hemorrhage and diabetes mellitus.

Victor Bodine Ayers, Buena Vista, Colo.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; served during the World War; aged 69; died, August 5, in the Red Cross Hospital, Salida, of mesenteric thrombosis.

Walter C. Byrne, Elmira, N. Y.; Georgetown University School of Medicine, Washington, D. C., 1892; member of the Medical Society of the State of New York; at one time county coroner; aged 70; died, August 15, of coronary occlusion.

Henry Clay Hornsby, Burning Springs, Ky.; Louisville Medical College, 1898; member of the Kentucky State Medical Association; aged 80; died, August 4, in St. Joseph Hospital, Lexington, of pyloric obstruction, probably carcinomatous.

Ivan King, Chicago; Chicago Medical School, 1928; Université de Genève Faculté de Médecine, Switzerland, 1932; member of the Illinois State Medical Society; aged 44; died, July 30, in the Michael Reese Hospital of pyelonephrosis.

Joseph Arda Hall, Cincinnati; Miami Medical College, Cincinnati, 1897; served during the World War; fellow of the American College of Surgeons; aged 67; died, August 8, at Sugar Hill, N. H., of a ruptured aneurysm of the aorta.

John Cornelius Shoudy ✠ Syracuse, N. Y.; Syracuse University College of Medicine, 1890; for many years a member of the staff of the Crouse-Irving Hospital; aged 71; died, August 4, of coronary thrombosis and arteriosclerosis.

Lafayette Van Amburg, Jackson, Miss.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1885; aged 81; died, July 17, in the W. A. Foote Memorial Hospital of auricular fibrillation and arteriosclerosis.

Charles Edward Clingan, Sioux City, Iowa; Rush Medical College, Chicago, 1877; member of the Iowa State Medical Society; aged 89; died, August 8, on a ranch near Sundance, Wyo., of myocarditis and arteriosclerosis.

Samuel F. Haverstock, Detroit; Detroit College of Medicine, 1909; member of the Michigan State Medical Society; on the staff of the Lincoln Hospital; aged 59; died, August 9, as the result of an automobile accident.

Kenneth Parnell Foster ✠ Gloversville, N. Y.; University of Buffalo School of Medicine, 1931; member of the Medical Society of the State of New York; aged 32; died, August 19, of a gunshot wound in the head.

George Henry Hooper ✠ Belmont, Mass.; Tufts College Medical School, Boston, 1919; on the staff of the Cambridge (Mass.) Hospital; aged 49; died, July 24, of duodenal ulcer and mediastinal lymphoblastoma.

Frederick Albert Cook, East Aurora, N. Y.; University of the City of New York Medical Department, 1891; explorer; aged 75; died, August 5, in the New Rochelle (N. Y.) Hospital of cerebral hemorrhage.

William Hugh Carroll, Oak Terrace, Minn.; University of Minnesota Medical School, Minneapolis, 1933; aged 31; died, August 7, in the Eitel Hospital, Minneapolis, of subacute bacterial endocarditis.

Edward E. Carter, Arkadelphia, Ark.; Gate City Medical College, Dallas, Texas, 1905; member of the Arkansas Medical Society; aged 64; died, August 7, of cerebral hemorrhage and diabetes mellitus.

Rudolph Hanover, McKees Rocks, Pa.; Baltimore Medical College, 1906; member of the Medical Society of the State of Pennsylvania; aged 62; died, August 1, in the Montefiore Hospital, Pittsburgh.

Jesse Lane Wikle, Anniston, Ala.; University of Georgia Medical Department, Augusta, 1879; formerly mayor and state senator; aged 85; died, July 25, in a local hospital of chronic myocarditis.

Harlo Adoniram Fiske, Springfield, Mass.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1877; aged 89; died, August 8, of myocarditis.

Marietta C. Catalano-MacLean ✠ Buffalo; University of Buffalo School of Medicine, 1923; aged 42; died, August 3, in the Millard Fillmore Hospital of peritonitis following a cesarean section.

William Roe Foard, Cumberland, Md.; Baltimore Medical College, 1903; aged 58; died, August 4, in the Allegany Hospital of injuries received when he was struck by an automobile.

John Campbell Tilt, St. Joseph, Mo.; St. Louis University School of Medicine, 1903; member of the Missouri State Medical Association; aged 70; died, July 30, of coronary occlusion.

Theodore Dwight Foljambe, Madison, Ohio; Cleveland Medical College, 1891; aged 70; died, July 29, in the Lake County Hospital, Painesville, of empyema of the gallbladder.

Thomas Dudley Merrick, Richmond, Va.; Jefferson Medical College of Philadelphia, 1888; member of the Medical Society of Virginia; aged 77; died, July 28, of paralysis agitans.

George Franklin Way ✠ Lincoln, Maine; Bellevue Hospital Medical College, New York, 1897; formerly county medical examiner; aged 65; died, July 30, of angina pectoris.

J. S. Smith ✠ Radford, Va.; College of Physicians and Surgeons, Baltimore, 1887; aged 78; died, July 23, in the New Altamount Hospital, Christiansburg, of myocarditis.

Reinhard Roerig, Parsons, Kan.; Julius-Maximilians-Universität Medizinische Fakultät, Würzburg, Bavaria, 1896; aged 73; died, July 11, in Independence of a fractured hip.

William Isaac Painter, Tazewell, Va.; Jefferson Medical College of Philadelphia, 1894; member of the Medical Society of Virginia; aged 70; died, July 20, of heart disease.

Merton Elbridge Rideout ✠ Waupaca, Wis.; Northwestern University Medical School, Chicago, 1904; aged 63; died, July 22, of coronary sclerosis and arteriosclerosis.

William L. Wise, Chopin, La.; Memphis (Tenn.) Hospital Medical College, 1903; member of the Louisiana State Medical Society; aged 64; died, July 24, of heart disease.

Thomas Dennis Kelly, Miami, Fla.; Columbia University College of Physicians and Surgeons, New York, 1919; aged 46; was found dead, July 29, of coronary occlusion.

Cornelius M. Dailey, Carnegie, Pa.; Baltimore Medical College, 1905; aged 63; died, August 19, in the Harrisburg (Pa.) Hospital of glomerular chronic nephritis.

Edgar A. Peck, Valparaiso, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1880; aged 82; died, August 10, of bronchopneumonia.

Frances Wallach Monell, Great Neck, N. Y.; New York Medical College and Hospital for Women, New York, 1889; aged 89; died, July 13, of arteriosclerosis.

Andrew Lyman Paey, Norfolk, Va.; Meharry Medical College of Walden University, Nashville, Tenn., 1905; aged 65; died, July 27, of arthritis deformans.

Walter H. Allen, Alta, Ill.; Barnes Medical College, St. Louis, 1897; aged 79; died, August 16, in St. John's Hospital, St. Louis, of carcinoma of the kidney.

Richard H. Speight Jr., Rocky Mount, N. C.; University of Maryland School of Medicine, Baltimore, 1901; aged 61; died, July 31, of coronary thrombosis.

Park Laurimore Berkshire, Lewisport, Ky.; Barnes Medical College, St. Louis, 1901; aged 65; died, July 28, of cardiorenal disease and hypertension.

Bernard Thomas Colglazier, Kansas City, Mo.; Kansas City College of Medicine and Surgery, Kansas City, 1921; aged 46; died, July 5, of heart disease.

Alvah Henry Jensen ✠ Hutchinson, Minn.; University of Minnesota Medical School, Minneapolis, 1925; aged 44; died, July 8, of coronary thrombosis.

Jacob Edgar Mendelsohn, Akron, Ohio; Maryland Medical College, Baltimore, 1912; aged 55; died, July 23, of coronary disease and diabetes mellitus.

Edward Chase Cook ✠ York Village, Maine; Medical School of Maine, Portland, 1894; aged 70; died, July 9, of cardiovascular renal disease.

Charles Judson Sawyer ✠ Windsor, N. C.; College of Physicians and Surgeons, Baltimore, 1895; aged 72; died, July 28, of coronary thrombosis.

Emily Wright, Springboro, Ohio; Woman's Medical College of Pennsylvania, Philadelphia, 1889; aged 80; died, July 13, of carcinoma of the rectum.

Harry Edward Barco, Blackstone, Va.; Howard University College of Medicine, Washington, D. C., 1911; aged 58; died, July 27, of carcinomatosis.

Albert P. Rocquet, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1889; aged 74; died, July 18, of nephritis.

William Abner Wyatt, Rosie, Ark.; Barnes Medical College, St. Louis, 1899; aged 74; died, July 12, of hypertension and arteriosclerosis.

Jefferson F. Landen, Chinquapin, N. C.; University College of Medicine, Richmond, Va., 1905; aged 78; died, July 16, of coronary occlusion.

Everett A. MacDonald ✠ Beverly Hills, Calif.; Medical College of Ohio, Cincinnati, 1895; aged 69; died, August 3, of coronary occlusion.

John Franklin Kirksey, Mayfield, Ky.; University of Louisville Medical Department, 1897; aged 65; died, July 28, of cerebral hemorrhage.

Jacob Aldrich Wood, Syracuse, N. Y.; Albany (N. Y.) Medical College, 1873; aged 92; died, July 21, in Constantia of lobar pneumonia.

Eugene A. Brown, Brewster, N. Y.; Hahnemann Medical College and Hospital, Chicago, 1878; aged 92; died, July 12, of arteriosclerosis.

William Ross Johnston ✠ Charlottesville, Ind.; Medical College of Ohio, Cincinnati, 1891; aged 73; died, August 8, of heart disease.

Charles Weakley Parker, St. Louis; University Medical College of Kansas City, Mo., 1891; aged 74; died, August 8, of heart disease.

Charles Fremont Hatcher, Ames, Iowa; Drake University Medical Department, Des Moines, 1888; aged 82; died, July 26, of uremia.

John Elliott Payne, Afton, Iowa; College of Physicians and Surgeons, Keokuk, 1896; aged 67; died, July 25, of heart disease.

Bureau of Investigation

SOME FRAUDULENT "CANCER CURES"

Science and scientific medicine continue to advance rapidly, in spite of which fraudulent "cancer cures" seem to go on forever —until some are overtaken by the United States Post Office Department or other federal agencies. In recent months the Post Office has caught up with some of these swindles and debarred them from the mails.

SAURINOL OIL AND SALVE

The Saurinol Distributors Corporation and John H. Olmes, Secretary, at Colorado Springs, Colo., and John H. Olmes at Pueblo, Colo., sold products through the mails under the false representations that when used as directed they would overcome and cure exposed cancer and many other conditions.

The Post Office memorandum brought out that some of the Saurinol advertising bore the claim that "This booklet is not issued to deceive or mislead the public, but as a guide for the user to administer 'Saurinol.'" Apparently unimpressed by this declaration of virtue, the Post Office proceeded with its investigation. From one Adam Griesener, President, and John H. Olmes, Secretary-Treasurer of the concern, the information was obtained that Saurinol Oil was the unrefined product of three wells located in Fremont County, Colo., and that the salve was prepared for the promoters by a chemist in Colorado Springs. A government chemist brought out that his analysis of the liquid Saurinol showed it to be a burning mineral oil containing 0.09 per cent of cinchona alkaloid, with a small amount of asphalt and a trace of ichthyol and the Saurinol Salve to contain 1.6 per cent of camphor and turpentine in a base of petrolatum and beeswax, with traces of paraffin and ichthyol.

Expert medical testimony introduced at the hearing showed that, aside from forming a protective covering for skin lesions both the Saurinol products would act merely as astringents and counterirritants and would be without therapeutic effect in the treatment of any cases of cancer or the other disorders for which they were promoted. The expert testimony also brought out that adequate treatment of any of these conditions must be based on proper diagnosis and remedies suited to the individual patient. Further, it was shown that in cancer the affected tissues must be subjected to microscopic examination prior to treatment by surgery, radium or roentgen ray, in accordance with the needs of the case.

According to the Post Office memorandum, inquiries addressed to the Saurinol concern after the Post Office investigation had begun also resulted in the receipt of replies soliciting remittances in the name of B. H. Rouse, M.D., at Florence, Colo. (Benjamin H. Rouse of Florence, Colo., appears in the American Medical Association's records as a graduate of Loyola University School of Medicine, Chicago, in 1919. He was licensed to practice in Illinois in 1920 and obtained reciprocal licenses in Idaho, Kansas, Nevada and Colorado.) In spite of the fact that Rouse had replied to inquiries sent to the firm, he denied any connection with the sale of the Saurinol nostrums. His letters to the Post Office Department indicated that in addition to Saurinol Oil and Salve he might furnish other treatment. Since the exact character of such treatment had not been ascertained, inclusion of his name in the fraud order was not deemed advisable by the Post Office.

The order was issued Feb. 29, 1940.

It is also worth noting that another government agency had earlier taken action against the concern. In July 1939 the Food and Drug Administration seized in interstate commerce a consignment of Saurinol that had been shipped by the Saurinol Distributors Corporation and charged that false and misleading statements on the label representing it as a relief from exposed cancer, varicose veins, pyorrhea, ulcers, skin diseases and some other disorders were a violation of the Food, Drug and Cosmetic Act. Government chemists reported that the stuff was essentially medium boiling petroleum oil. As the Saurinol concern put up no defense the shipment was confiscated.

THE GRAFANOL FRAUD

From Durant, Okla., an outfit operating under the titles Grafanol Company and Grafanol Corporation, and run by one W. F. Grafa, sold "Grafanol Ointment" through the mails under the false and fraudulent representations that it was a highly effective remedy and cure for any case of skin cancer and many other disorders, chiefly those of the skin. The concern also sold by mail something called "Maytubby Springs Sour Water," which it fraudulently represented as a highly effective remedy and cure for any case of stomach trouble, kidney trouble, rheumatism or eczema. Names secured in various ways were solicited with circular matter which abounded in testimonials purporting to come from persons who had been "cured" by Grafanol.

A government chemist reported that Grafanol was a black viscous mixture of petrolatum products, water, sand and calcium oxide. The government's medical expert testified that the stuff would not and could not cure any case of cancer or blood poisoning.

The government chemist also analyzed Maytubby Springs Sour Water and testified that it contained 0.156 Gm. per hundred cubic centimeters of sodium sulfate, with traces of chloride, iron and other minerals, not named. The medical expert mentioned also testified regarding this water, stating that it would have no therapeutic action whatever, that its use was merely equivalent to the taking of an equal quantity of ordinary tap water and that it would not or could not overcome or cure stomach trouble, kidney trouble or eczema.

The fraud order was issued May 23, 1940.

An outfit known as R. F. Grafa & Sons, Durant, Okla., which may have been an earlier name for the same concern, was declared by federal authorities in 1932 to have violated the Pure Food and Drugs Act in fraudulently representing on the labels of its Grafanol Ointment that this was a remedy for skin cancer and many other disorders. The case was described in Notice of Judgment 19029, issued in July 1932.

SUSSMAN'S DIETARY "CANCER CURE"

"Buy my book and cure your cancer" might well have been the advertising slogan of one Ben Sussman of New York, who, operating as the Lujen Publishing Co., put out a volume "My Fight Against Cancer." The claims it contained were so obviously fakish that the Post Office Department declared its sale to be a scheme for obtaining money by means of false and fraudulent pretenses, representations and promises and debarred it from the mails.

According to the Post Office memorandum on this case, Sussman had been successively a life insurance agent, a real estate salesman and, from 1907 to 1922, the operator of a woman's apparel store. In the latter year, it appears, he retired from active business because of an illness which was described in some detail in his book. The first mention it made of cancer was as follows:

> In 1927 and 1928, I was treated by an eminent skin specialist for a cancerous growth on the back of my neck and cysts back of my ears. This treatment consisted of X-Ray and Radium and I was considered cured. A few years later, some of the old trouble came out on my back and under my arm pit.
>
> In the meantime, a sister-in-law of mine passed away of cancer, and my wife had been sick for a number of years with tumor and cancer. We went to Saratoga every year for treatment. We had used the best doctors, but to no avail. . . .

Sussman reluctantly divulged the name of the specialist mentioned. When this physician was asked by the government for the facts, he replied that he had treated the man between October 1926 and March 1930 for a pedunculated keloidal growth on his neck and various other conditions, but nothing of a malignant nature, nor was there any cancerous or other serious condition involved.

A few years after the foregoing treatment, according to Sussman, "some of the old trouble came out on my back and my arm pit." He later referred to this "old trouble" as being warts, wens, pimples or cysts, any of which, he asserted, was in his view the same as cancer or cancerous growth! His book relates his quest for a cure:

> . . . I went again to Saratoga, took the baths and treatments, and again come in contact with some of the greatest men from all parts of the world and also with some of the best doctors. They . . . advised me that if I could acquire the knowledge of nutrition and food chemistry of the different elements and ingredients that certain foods contain in their natural state, I would be able to correct many of the ill results which abuse of my body had caused to develop, (over a long period of years). Since that time I have been searching far and wide and reading all kinds of books on cancer. I also attended numerous lectures and health classes conducted by doctors. I discovered that the real cure depended upon myself, providing I had the will power and backbone to do away with the old habits of living, and had the knowledge of how to live today, forget the past, and think only of the present.
>
> After every so-called treatment, for the last 20 years, had failed me, I gave myself completely over to science and Mother Nature. With this aim in mind, I made many different experiments upon myself in the past six years, and watched the reactions to the ways of living which I had adopted for myself. Today, thank God for the wisdom and understanding of body chemistry, as I near my sixtieth birthday on December 23rd next, I feel better and look better than I did 20 years ago.

Thus, says Sussman's book, he cured himself by his vegetable and fruit diet of

> all sorts of toxins, tumors and cancerous growths that had developed in me. Actually they were blocking the intestinal tract for the past 20 or 25 years. . . . I was able to dissolve all the impurities contained in my body for a number of years, from the combination of natural chemical elements of vegetables, such as carrots, pure grape fruit juice, garlic, celery, limes or lemons, watercress, parsley, cabbage, onions, spinach, beets, escarole, orange juice, seedless grapes, and black mission figs, soaked over night.
>
> I used carrot juice with certified milk and a little evaporated milk, according to taste, about a quart a day, and I found this to be the most alkaline food for one suffering from tumors or cancer. Within a few weeks I realized that the pains in my stomach and in my entire body were gradually disappearing.

Because some statements made by Sussman at the government hearing contradicted some of his others as to the periods when he suffered from the declared disorders, his testimony was found to be so irrational as to deserve little if any credence. For that reason the acting solicitor for the Post Office Department who handled this case was convinced that Sussman had never had cancer. When Sussman was questioned about the various items in the diet that he claimed had "cured" him, he was unable to give intelligent answers. Further, although he claimed he had read "all kinds of books on cancer," he could not definitely identify even one such book, nor could he explain how "clogging" of the intestines could supposedly cause cancer. Also he was unable to explain why he drew a distinction between what he called cancer and cancerous growth, or the difference between a benign and a malignant tumor, or between a tumor and a cancer. Finally he admitted that all these terms meant the same to him. Typical of his erratic testimony was his assertion that although he regarded cancer as first in the order of maladies causing fatalities in this country he did not consider it a "serious disease." Although he claimed to base his "cure" on combinations of vegetables and fruits, he was unable to name even the primary constituents of foods: carbohydrates, fats, proteins, vitamins and minerals.

Expert medical testimony introduced at the hearing showed, according to the Post Office Department, that if persons having cancer undertook the treatment Sussman recommended, the result would be early and in many cases unnecessary death of such persons. The expert testimony also brought out that the only method by which a suspected cancer can be positively diagnosed as such is by means of a microscopic examination of the tissue surgically excised from the growth—a fact utterly unknown to Sussman—and that only scientific treatment can eradicate the cancer.

As Sussman conducted his swindle under the title of the Lujen Publishing Co., the fraud order issued March 7, 1940, unfortunately covered only this name and not that of Sussman as an individual.

Correspondence

ERROR IN WORK ON INFANTILE PARALYSIS

To the Editor:—My attention has recently been called to the fact that in volume A 40 of the International Bulletin dealing with Infantile Paralysis, published and distributed in the United States by the National Foundation for Infantile Paralysis, Inc., there is a statement on page 75 in French and on page 79 in English that is exceedingly ambiguous. This reads "Thus, he was led to the conclusion that 0.10G. of potassium chlorate, per kilo of body weight, given in syrup of raspberry, every two hours, during the daytime and at night, proved to be the optimal dosage."

This is not to be interpreted to mean that 0.10 Gm. of potassium chlorate is to be administered every two hours. This would be far in excess of the maximum tolerated dosage. This statement should be interpreted as being a total of 0.10 Gm. of potassium chlorate given, if at all, in twelve divided doses over a period of twenty-four hours.

DON W. GUDAKUNST, M.D., New York.
Medical Director, the National Foundation
for Infantile Paralysis, Inc.

TREATMENT OF DIABETES

To the Editor:—It was with dismay that we read in THE JOURNAL, August 10, statements of Dr. Edward Tolstoi at a conference of "the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments" regarding the treatment of diabetes. He said:

> We found that our experimental subjects were free from the symptoms of diabetes in spite of glycosuria when they were receiving a diet of 75 Gm. of protein, 60 Gm. of fat and 200 Gm. of carbohydrate, and protamine zinc insulin in daily doses of 50 units. Two rather unusual patients whom we observed in the metabolism ward for periods of, fifty to sixty days maintained their weight. I want to emphasize this point. They also had no thirst or polyuria; they had no ketonuria, and they were in nitrogenous equilibrium in spite of the fact that they excreted as much as 150 Gm. of sugar some days, and in spite of the fact that there was an ever present postprandial hyperglycemia. From such experiments we postulated that for patients treated with protamine zinc insulin the guiding features of satisfactory treatment should be (1) the maintenance of weight, (2) freedom from symptoms and (3) absence of ketonuria. Furthermore, we were not concerned about the hyperglycemia or the amount of dextrose excreted.

Does it make common sense to say that an adult of average body build and activity receiving 1,640 calories, daily in the form of carbohydrate 200, protein 75 and fat 60 Gm. who is excreting 150 or even 100 Gm. of sugar in twenty-four hours, thus leaving a net balance of 1,040 or 1,240 calories respectively, could maintain body weight and be in nitrogenous equilibrium for a prolonged period? Furthermore, is it sensible or economical to allow the wastage of so large a part of the food eaten?

According to Dr. Tolstoi, the patients were free from thirst and polyuria in spite of marked glycosuria. Let it be assumed, then, that the quantity of urine was normal and therefore approximately 1,500 cc. daily. If the patient voids 150 Gm. of sugar the proportion of sugar in that day's urine would be 10 per cent. Does it seem at all likely that the average diabetic patient will be symptomless while continuously excreting 10 per cent, or even 5 per cent, of sugar?

Progress in diabetes during the last fifty years has been by painstaking research. Certain bizarre methods of treatment have been introduced, but no successful method has totally disregarded facts. Each new method promulgated by responsible

physicians has been supported by data which, even though they might not convert others to the new idea, at least commanded respect. No matter whether the diet is high or low in carbohydrate, protein or fat or in total calories, the outstanding clinicians in this and other countries have sought to control the disease and in so doing have borne in mind the Naunyn dictum that the patient with severe diabetes, if carefully treated, is apt to do surprisingly well but the patient with mild diabetes, if neglected, does poorly.

Like many others, we believe in controlling the hyperglycemia of diabetes (1) because it is fundamentally an abnormal state, (2) because a high blood sugar is a constant stimulus for insulin secretion and allows no opportunity for rest and recuperation such as the pancreas of a healthy person enjoys between meals and at night and (3) because control of hyperglycemia and glycosuria proves utilization of the diet whereas their disregard leads, in our experience, to accessory annoyances such as polydipsia and polyuria, the attendant necessity for extra food to make up for the loss of calories in the urine and the obvious wear and tear on the system for ingestion, assimilation and excretion of this unutilized extra food, quite apart from needless cost and waste. A high percentage of sugar in the blood implies the same in the tissues; we think it likely that, directly or indirectly, this conduces to lack of normal tissue repair and resistance to infection, predisposes to degenerative phenomena in arteries and nerves and leads to weakness, weariness and impotence, although we freely admit that positive proof is lacking that all these harmful effects are due to hyperglycemia per se. Unhesitatingly we maintain that the blood sugar should approach normal because it is an index of the control of the diabetic condition; if normal, it is one assurance that the whole disease is being treated well. Hyperglycemia is the red light which the physician should no more disregard, although he cannot always explain its significance, than he should fail to heed the red signal at the railroad crossing because he cannot see the train around the corner.

Dr. Tolstoi's advice for certain cases of diabetic acidosis follows:

> First, let us consider the one whose condition is not far advanced, the patient as we see him in the clinic. He may report a sore throat. Examination of the urine reveals a 4 plus acetone reaction and diacetic acid. The skin and the tongue are dry, there is dehydration and there are listlessness and the desire to be left alone. We tell the patient "Go home, take a tablet or two of table salt (1 Gm. of salt) every hour, and follow that with a glass of water; in addition, take all the hot salt broth you can." We teach him to examine his urine for acetone and tell him to do so every two hours, and as long as acetone is present to give himself insulin (regular soluble) after each urine examination until the acetone bodies disappear. The dosage of insulin is determined by the urine analyses for sugar. He is told to take 25 units if the result of the test is yellow or red, 15 units if the specimen is green, and the juice of an orange if the Benedict solution is unchanged after boiling. This simple rule also protects the patients against insulin overdosage.

We condemn such advice. In our opinion it is dangerous to send home patients whose urine gives a 4 plus reaction for acetone and diacetic acid. Dr. Tolstoi does not even suggest that they keep under the supervision of their family physicians. If there is one thing we attempt to do as a result of our experience with patients in coma and near coma, with diabetic children and with diabetic patients in general, it is this—to train them, if any unusual symptoms occur, to call the doctor. A patient who exhibits "listlessness and the desire to be alone" is not likely to carry out intelligent, energetic self treatment.

We believe in the orthodox treatment of diabetes. We are convinced that our patients and the patients of other physicians do the best who follow the rules. Differences in diets of from 50 to 75 Gm. of carbohydrate a day are immaterial. By no means can we keep all our patients sugar free, but we do strive to maintain them under as good control as possible, thereby, as we believe, protecting them from complications and progression of the disease. Furthermore, as will appear in the forthcoming (October) (seventh) edition of the "Treatment of Diabetes Mellitus," we have endeavored to support our convictions by recording the complications, the causes of death and the duration of life in 5,669 of our fatal cases between 1898 and 1940. Tables show the decrease of deaths due to coma from 64 per cent to 4 per cent, the steady increase in duration of life after onset from 4.9 to 12.5 years and the advance in the average age at death from 44.5 to 64.8 years.

ELLIOTT P. JOSLIN, M.D.
HOWARD F. ROOT, M.D.
PRISCILLA WHITE, M.D.
ALEXANDER MARBLE, M.D.
Boston.

"METABOLISM OF IRON"

To the Editor:—In an editorial in THE JOURNAL, July 27, various claims were made for a method of following iron metabolism, making use of radioactive iron. The editorial writer appears to have overlooked a communication published in the November 1939 issue of *Physical Review* (Barnett, Abraham: The Use of Radioactive Forms of the Common Elements in Physiology, *Physical Rev.* **56**:963, 1939) casting serious doubts on the validity of conclusions drawn as to the behavior of nonradioactive metals from experiments carried out in which radioactive forms of the same elements are used. Briefly, taking the red cell as an example, it was pointed out that, since it is known that its limiting membrane is composed of an electrically charged polar lipoidal substance having a thickness estimated to be of the order of one molecule, the bombardment of the cell wall at close range by electically charged particles emanating from the radioactive ion might alter the polar properties of the wall and so modify its permeability. Moreover, the proteins in contact with the cell wall are known to be denatured by beta rays such as are given off by radioactive iron, and denaturation of intracellular proteins might grossly alter the behavior of the thin surface membrane.

It would appear that there is an urgent need for determining whether or not radioactive ions are capable of altering the permeability of cell membranes; otherwise the large amount of work now being published on the use of radioactive "tracers" may prove grossly misleading. Unfortunately, access to radioactive forms of the common elements is limited and the costly equipment necessary for studying them not always available. It is suggested that an answer to the various questions raised here might be found by the following simple experiments:

1. The electrophoretic migration speeds of red cells suspended in isotonic nonradioactive and radioactive sodium chloride or Ringer's solution containing these ions could be compared. A difference in speed would argue in favor of a modification of the charge on the red cell by the radioactive sodium.

2. The impedance of the two solutions in the low alternating current frequency range (10,000 down to about 10 cycles per second) could be compared. A difference in either the reactive or resistive components would argue in favor of modification of the membrane (Fricke, H., and Curtis, H. J.: The Electric Impedance of Hemolyzed Suspensions of Mammalian Erythrocytes, *J. Gen. Physiol.* **18**:821 [July] 1935. Cole, K. S., and Curtis, H. J.: Electrical Impedance of Nitella During Activity, *ibid.* **22**:37 [Sept. 20] 1938). Since changes in permeability of the red cell membranes are reflected best by measurements at low frequencies (Fricke and Curtis), a simple comparison of impedances at 60 cycles might suffice.

ABRAHAM BARNETT, M.D., New York.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

HIGH PROTEIN DIET—OBESITY

To the Editor:—**With regard to the question of meat in the diet, has any one cited absolute proof that "eating meat twice a day is harmful, increases blood pressure in a normal person, or decreases length of life by some way or other, usually believed to be by hurting the kidneys"? May I have an opinion on this? An argument arose because of a 23 year old man, some 20 pounds overweight, who is attempting to diet and eats meat twice a day. It is stated that he can't do much reducing because 50 per cent of his protein intake is converted to dextrose. Incidentally, the suggestion that he take magnesium sulfate twice a week to aid him brought the objection that it might derange his now perfectly normal morning habitual stool. Can you answer this? The suggestion that I watch his pulse, blood pressure and heart and give 2 grains of thyroid a day was voted down by his wife. I feel that my knowledge of his condition does not necessitate taking a basal metabolic rate and that thyroid in the amount suggested and continuance under my care could not be harmful. (The patient's parents both have low basal metabolic rates and are taking thyroid substance.) A check-up twice a week would forestall any impending harmful effects. (Of course 2 grains of thyroid a day is just to increase his metabolic rate and is not his tolerance dose.)**

M.D., Ohio.

ANSWER.—There is no real evidence that the amount of protein which could be consumed by the average person using ordinary foodstuffs (even if he ate meat twice a day) would "increase the blood pressure, harm the kidneys or decrease longevity in any other way." Such evidence as does suggest a possible harmful effect is based on the use of artificial diets containing dried animal proteins, in rats. These observations are based on extreme experimental conditions and highly refined criteria for judging the results. Their application to man and their clinical significance, even if applicable, are doubtful. On the other hand, there are experimental observations on men who lived on an exclusively meat diet for a year without any detectable ill effects. In this connection it must be remembered that meats contains large amounts of fat, and that even an exclusive meat diet need not contain as large a proportion of animal proteins as can be incorporated in an artificial diet by the use of dried proteins. A review and bibliography of this subject was published by Bischoff in the *Journal of Nutrition* **5**:431 [July] 1932.

The fact that a certain proportion of ingested protein is converted to dextrose has no bearing on the matter of weight reduction. Unless the sugar so formed is lost to the body (as may occur by excretion in the urine of a patient with uncontrolled diabetes) the ultimate caloric value of the ingested protein is independent of the intermediary metabolic processes which it may undergo. Whether an individual gains or loses weight, therefore, depends strictly on the balance between the total calories ingested in the form of any and all foodstuffs and the total calories expended during the same period, chiefly in the form of muscular work and heat.

The crucial importance of the balance between calories taken in and calories expended also determines the answers to the questions regarding the use of magnesium sulfate and thyroid. Each of these substances might cause some temporary loss of weight, provided the patient did not increase his food intake correspondingly. But the use of magnesium sulfate is not justifiable because (1) it produces its chief effect by dehydration, and the apparent weight loss can be restored by drinking a few glasses of water; (2) if used to excess it can interfere with food absorption, it may cause an enteritis, and will probably interfere with the regular stool habit; (3) it cannot be continued indefinitely as a treatment. The use of thyroid, except in instances of definite clinical hypothyroidism which apparently the case in question is not, is not to be commended because (1) it does involve possible harmful effects and (2) it cannot be continued indefinitely. It is the last reason in each case which is the most important objection to the use of these substances in the treatment of obesity. If weight reduction is accomplished by any temporary expedient without affecting the amount of food which the patient habitually consumes, it is obvious that he will gain back all the weight he has lost as soon as the treatment is suspended. The only real and permanent treatment for obesity when a patient is otherwise normal is the substitution of a new and better food habit for the old habit of overeating.

FLOOR FURNACE IN OPERATING ROOM

To the Editor:—**A small addition to my hospital includes in the operating room (10½ by 12½ feet) a floor furnace built by the Coleman Lamp and Stove Company having an input of 20,000 British thermal units and an output of 14,000. We have a thermostat to control it and keep it at any desired temperature. Is it necessary to turn the furnace off while operating? Would it be safe if the pilot light alone was kept burning? My object in asking these questions is that my anesthetist requested that the furnace be turned off and the pilot light be extinguished before starting the anesthetic (ether). I understood before installing the furnace that it was safe for the purpose. Please advise me.**

J. Guild Wood, M.D., Weatherford, Okla.

ANSWER.—It is well known that ether vapor is a little over two and one-half times as heavy as air. This means that ether vapor during anesthesia will flow from the point of administration to the floor and will then follow the drift of floor currents. It is understood that cold air from the floor is sucked to the outer jacket of the Coleman heater, where it comes in contact with the stove, and when warmed will form a shaft of hot air in the center of the steel register. Thus, the direction of circulation is from the floor with its high concentration of ether vapor to the hot stove. Exactly what mixture of ether and air will prevail will vary from minute to minute depending on the amount of administration and the technic used (opened or closed). Limits of flammability of ether-air mixtures range from 1.85 to 36.5 per cent by volume. Thus, with such a wide range, ether-air mixtures must be considered flammable.

The next point of interest is the minimum ignition temperature of ether-air mixtures. The United States Bureau of Mines states that this temperature is 304 C. Thus if the inner core of the heating system approaches or exceeds this temperature, it would cause ignition of the ether-air mixture which would necessarily come in contact with it.

An additional interesting fact is that the volume of air rendered explosive by 1 pound of ether at 60 F. and under one atmosphere of pressure is 277 cubic feet.

So far, only normal satisfactory working conditions for the Coleman stove have been considered. But the possibility of leaks in the stove and circulating mechanism or of possible backfire must not be overlooked. Under such conditions, an open spark might easily explode an ether-air mixture.

It is therefore believed on purely theoretical grounds that the suggested use of the Coleman heater in an operating room where ether is the anesthetic agent is not without danger.

All figures cited are from the Explosion Division, Pittsburgh Station, U. S. Bureau of Mines (Jones, G. W., chemist: The Explosion and Fire Hazard of Combustible Anesthetics).

INTRAVENOUS ALCOHOL FOR ALCOHOLIC ADDICTS

To the Editor:—**I would appreciate any information available about the injection of alcohol for the treatment of alcohol addicts. An article came out in the *Magazine Digest* of December 1939 condensed from an article in *Je sais tout*, Paris, by Joseph Andrieu, in which it is said "It is common to inject 40 cc. of alcohol (20 cc. in the morning and 20 cc. at night) which is ordinarily bought at the pharmacists." After two days' treatment the patient is supposed to be considerably improved and after five days he is cured.**

R. W. Mann, M.D., Toronto, Ont.

ANSWER.—In the September 1939 issue of *Je sais tout*, a popular French magazine, is an article by Joseph Andrieu, D.Sc., concerning the treatment of chronic alcoholism. Andrieu gives Dr. Bruel credit for the theory that the morbid symptoms in chronic alcoholic addicts are due to withdrawal of alcohol and that a steady supply of alcohol tends to keep these persons apparently normal (Bruel, L.: Campaign Against Chronic Alcoholism: Intravenous Injections of 30 Proof Alcohol, *Echo méd. du nord* **10**:497 [Aug. 31] 1939. Santa Cruz Salazar, Edilberto: Intravenous Alcohol, *Crón. méd.* **55**:17 [Jan.] 1938). Bruel's treatment consists in the intravenous injection of 15 per cent alcohol by weight (30 degrés—probably about 30 proof), 50 cc. the first day and decreasing to 20 cc. on the fifth. "No pain or after affects are noted." Four out of five are said to be cured.

It is true that alcohol may eventually cause changes in the nervous system which are manifested by extreme unrest; more alcohol is then taken because the narcotic action of alcohol counteracts the nervousness, and so a vicious cycle is established. There is no doubt that a person who is at the verge of delirium tremens is temporarily benefited by alcohol, regardless of the method of administration. As the value of giving alcohol to alcoholic addicts is to prevent sudden withdrawal with subsequent onset of delirium tremens (a state in which much damage is often done to the patient) if the patient cannot consume alcohol by mouth, it would seem rational to give it intravenously, gradually decreasing the dose each time, similar to the way in which withdrawal of alcohol by mouth is accomplished. Until more concrete evidence is available, it is advisable not to become too enthusiastic over Bruel's treatment.

BELL'S PALSY AND SYPHILIS

To the Editor:—**A man aged 38 has a left sided Bell's palsy of three weeks' duration which was found to be of syphilitic origin; both the Kahn and the Wassermann reaction have been positive on two different occasions. He has also had severe pressure pains just posterior to the left ear. I have been giving him antisyphilitic treatment consisting of bismuth subsalicylate and potassium iodide. Is this the proper routine to follow? What type of syphilis could this be without any history of a primary or secondary lesion? A spinal fluid examination has been flatly refused by the patient. When, if ever, is electrical stimulation necessary? Is massage of definite value in such cases? What is the usual rate of improvement in these cases and what is the prognosis?**

M.D., Illinois.

ANSWER.—This man evidently is syphilitic but in the absence of a spinal fluid examination it cannot be taken for granted that the facial paralysis is due to syphilis. Facial paralysis of the ordinary peripheral type, so-called Bell's palsy, is common both in healthy people and in people who have some other disease. If any other cranial nerve is affected or if there are any cerebral symptoms, one would assume that syphilis is the cause. To make a prognosis and decide on the mode of treatment it is well to test the facial nerve and the muscles supplied by it with the faradic current. If there is normal response the prognosis is good for recovery within a few weeks, with or without treatment of any kind. If the response is lost it is well to give the muscles treatment every day or two with the galvanic current by means of an interruptor handle. Faradic treatment is, of course, useless. Massage of the face muscles is of some use in lessening the amount of atrophy by improving the circulation in the muscles. The treatment used for the syphilis may suffice if there is no involvement of the nervous system but the patient ought to be told about the serious risk he runs by not submitting to spinal puncture at this time when any eventual involvement of the nervous system might still be checked. If he persists in refusing spinal puncture it would be advisable to treat for syphilis in addition to the other remedies. If spinal puncture is made and the fluid gives a positive reaction, tryparsamide would probably be the drug of choice.

EOSINOPHILIA WITH GASTROINTESTINAL SYMPTOMS

To the Editor:—**A married woman 36 years old has an irrelevant family history. Her own past history is essentially noncontributory except for her first pregnancy, the child being stillborn at 7 months. She subsequently had two normal labors. Her chief complaint, ten weeks ago, was pain across the upper abdomen, arising in the epigastrium and radiating to the right and left hypochondrium. The character was described as mainly colicky but at times sharp. The pain was neither relieved nor aggravated by food. About one hour after the onset of the pain the patient begins to vomit repeatedly. This also does not relieve her. An attack may come on at any time of day. After several days of pain and vomiting she will be free of symptoms for a few days and then another attack begins. When the pain is severe she feels like moving her bowels, but after one or two rather loose motions her efforts are futile. Her appetite is good but she has been losing weight steadily (32 pounds [14.5 Kg.] in the last six weeks) presumably due in part to her vomiting and fear of eating. There has been no melena or hematemesis, no jaundice or "indigestion." She avoids fatty foods somewhat. At times she complains of a feeling of "clogging up" in her neck, relieved by vomiting. This has been present for three months. Otherwise the history is irrelevant except that three years ago she had one of these attacks for a short time. Physical examination on three separate occasions showed generalized tenderness over the gallbladder region. Rectal examination was too painful to permit of any significant evidence being obtained. Vaginal examination revealed acute tenderness in the right fornix and slight tenderness in the left fornix. No masses were felt and the uterus presented no abnormality. The urine was normal on a number of occasions. The Wassermann test was negative. The red cell count was 4,800,000 and hemoglobin 86 per cent Sahli. The white count was 7,950 with polymorphonuclears 47 per cent, lymphocytes 27 per cent and eosinophils 26 per cent. This count has been confirmed in two different hospitals. Repeated examination of the stools for ova or parasites has been negative. Biopsy of a portion of the deltoid for cysts was also negative. Culture of the stools has been negative except for more or less fungous growth which seems to be either a monilia or a streptothrix. Gastrointestinal x-ray studies show considerable gastric retention after eight hours with no evidence whatever of ulcer or abnormality. There seems to be a severe ileitis. The temperature has been more or less normal throughout. X-ray examination of the chest is also negative. There are no complaints or observations referable to the other systems.**

M.D., Vermont.

ANSWER.—It is most difficult to explain the eosinophilia in this case. The normal total white count with more than 2,000 eosinophils per cubic millimeter rather restricts the probabilities, but none of the probabilities suggested fit well into the clinical picture. In nearly every instance in which the white count is within normal limits and at the same time the total eosinophil count exceeds 2,000 (2,067 in the present case) the cause is likely to be trichinosis, arsenic poisoning, eosinophilic leukemia, dermatitis herpetiformis, periarteritis nodosa, Hodgkin's disease or lymphosarcoma. Only the first two are common causes.

The gastrointestinal symptoms, without positive observations, point to a functional origin. The gastric retention seems to indicate pylorospasm. It seems likely that the "ileitis" may be bowel spasm. It would seem wise to investigate the function of the gallbladder, although the presence of gallbladder disease would not be likely to produce such a violent clinical picture.

If the diagnosis of functional gastrointestinal disorder is permitted, one must decide whether the underlying factors are psychic or allergic. An allergic cause would offer some explanation for the eosinophilia. Other well known allergic responses such as bronchial asthma and urticaria are associated with eosinophilia but rarely to such a degree.

In this case, then, the causes of eosinophilia should be carefully reviewed. The problem of trichinosis seems to have been adequately dealt with. Possible allergens, particularly drugs or foods, should be sought for to explain both the eosinophilia and the gastrointestinal symptoms.

EXPRESSION OF HUMAN BLOOD CONSTITUENTS

To the Editor:—**In the last few years certain chemical substances, notably the serum chlorides and serum sodium as well as others, have been expressed in milliequivalents per liter rather than in milligrams per hundred cubic centimeters, which is the usual standard of measurement. This is rather confusing to clinicians, even those who have left medical schools recently. Could you please give me the normal ranges of the common chemicals such as sodium, potassium, chlorides and carbon dioxide expressed in milliequivalents per liter? Will you also kindly explain the reason for using milliequivalents rather than milligrams per hundred cubic centimeters in such cases?**

M.D., New Jersey.

ANSWER.—The normal ranges of certain human blood constituents are as follows:

	Mg. per 100 Cc. in Serum	Milliequivalents per Liter of Serum	Millimols per Liter of Serum
Sodium	320-350	139-152	139-152
Potassium	16-22	4.1-5.6	4.1-5.6
Chloride	350-390	99-110	99-110
Calcium	9-11	4.5-5.5	2.25-2.75
Magnesium	2-3	1.6-2.5	0.8-1.25
Carbon dioxide, volumes %	50-60	44-52	22-26

The millimols per liter are calculated by dividing the milligrams per liter by the atomic weight of the element. The milliequivalents are the same as the millimols per liter in all cases in which the valence is 1, but if it is 2, as in the bivalent elements or radicals, the milliequivalents would, of course, be twice the millimol values. In the case of carbon dioxide the results are usually expressed as percentage by volume of carbon dioxide gas. In other words, 50 volumes per cent means that 1 liter of serum yields 500 cc. of carbon dioxide gas. Now 1 gram molecule of any gas under standard conditions is 22.4 liters, or 1 millimol is $\frac{1}{1,000}$ of that, or 22.4 cc. Hence 500 cc. of carbon dioxide would represent $\frac{500}{22.4}$, or 22 millimols. However, since carbon dioxide represents a bivalent acid, the milliequivalent value would be twice that, or 44 millimols. The advantage of the milliequivalent system is that calculation can be made easily in terms of one ion substituted for another or balancing another. Thus, 1 milliequivalent of any ion is always equivalent to any other milliequivalent of any other element or radical in balancing negative and positive ions or in substitution.

LESIONS OF TULAREMIA IN RABBITS

To the Editor:—**Is it possible for one to tell on gross examination whether a rabbit has tularemia? Specifically, could a vender of meats tell by inspection of the dressed rabbit? Would the liver show any gross evidence? Or any other organ or part of the rabbit? Are domestic rabbits likely to have the disease or does it occur solely in wild rabbits?**

M.D., California.

ANSWER.—Although ordinarily it is possible to tell on gross examination of the spleen or liver whether a rabbit has tularemia, in some instances the characteristic whitish pin head to match head size tubercle-like foci of necrosis may be so small as to be barely visible with the use of a hand lens; in rare instances such lesions may be completely invisible grossly. It would not be possible for a vender of meats to determine the presence or absence of tularemia by inspection of dressed rabbits, since there are no distinctive lesions in the muscles, fat or bones. Pasteurella tularensis (Bacterium tularense) is, however, distributed throughout the muscle of infected animals and will survive several months of exposure to subfreezing temperatures. The typical lesions are to be found in the spleen, liver and lymph nodes. The disease does not occur in nature in domesticated rabbits; such rabbits are, however, susceptible to experimental production of the disease.

PNEUMONIA AND BRONCHIECTASIS—HAND DISABILITY FROM OLD BULLET WOUND

To the Editor:—A man aged 46, a veteran of the last war, presented himself for examination because of severe recurring bronchitis. He states that in 1916, after serving for two years, he developed bilateral pleurisy and pneumonia. Following recovery from this he found that every spring and fall he has attacks of bronchitis with expectoration of green sputum. Lately the condition has become more severe, and during any spell of damp weather he is subject to this distressing condition. In such a case could one assume that the pneumonia and pleurisy in 1916 have any bearing on the recurrent bronchitis? Prior to 1916 his physical condition was excellent. Secondly, in your opinion would such a person merit a pension? Furthermore, a bullet passed through the left forearm of the patient in 1918, since which date there have been attacks of intermittent swelling of the back of the left hand with numbness and stiffness of the little and ring fingers. Sensation is good throughout but muscle power is impaired. Can anything be done about this? The man is a farmer and because of these two conditions he is partially incapacitated.

Nathan Schecter, M.D., Ottawa, Ont.

ANSWER.—It is extremely difficult at this date to show a direct causal relationship between the bronchitis of today and the pneumonia of 1916 and it would seem equally difficult to prove that such a relationship did not exist. From the history it may be assumed that the patient has a bronchiectasis. Such a complication is not uncommon following influenzal pneumonia. Bronchiectasis is rare following pneumococcic pneumonia but it does occur. It is possible that an x-ray examination of the chest might be helpful but it is doubtful that even this will settle the question of causal relationship.

The only opinion of any value on the pension question is the opinion of the board that administers pension matters.

There can be no question of the service connection of the hand disability. Any improvement in this condition would be dependent on the present cause of disability. Is it a nerve injury or muscle injury? Is there mechanical circulatory obstruction due to contraction of scar tissue? When these points are determined, the advisability of a surgical attempt to correct the disability may also be determined.

IMMUNITY IN DIPHTHERIA

To the Editor:—May I have your opinion on the following statements: 1. "The immunity conferred by one attack of diphtheria is not of long duration, amounting probably to a few weeks or months only" (from Holt and Howland: Diseases of Infancy and Childhood, ed. 9, p. 851). 2. Toxin-antitoxin inoculations have been used in those found susceptible by the Schick test. Three injections are given at weekly intervals. The immunity may last for two years (from Osler and McCrae: The Principles and Practice of Medicine, ed. 9).

M.D., Arizona.

ANSWER.—1. In a large contagious disease hospital where approximately 20,000 cases of diphtheria have been treated over a period of years, second attacks of the disease have been witnessed hardly more than half a dozen times. Ordinarily it may be assumed that one attack of diphtheria does confer an immunity which is usually permanent.

2. Immunity established by the injection of three doses of toxin-antitoxin at weekly intervals is generally protective for a period of at least two years. At present three doses of plain toxoid or two doses of alum precipitated toxoid administered at intervals of from three to four weeks are preferred to toxin-antitoxin.

PLEURAL EFFUSION

To the Editor:—A pleural effusion (left side) following the course of high voltage roentgen treatment of a huge uterine fibroma developed the second week of irradiation. The following interpretations are possible: (1) a malignant growth with pleural or pulmonary metastases; (2) excessive irradiation; (3) an independent condition or disease, sui generis. Could you furnish information relative to the frequency of an afebrile pleural effusion encountered in the course of x-ray irradiation of the abdomen? Can carcinosis of the peritoneum or a sarcomatous degeneration of a uterine fibromyoma produce pleural effusion as the first manifestation of a generalized process?

M.D., New York.

ANSWER.—The pleural effusion is probably secondary to pleural or pulmonary metastases from a uterine sarcoma. Although there are references in the literature to pleural effusion secondary to roentgen treatment of the chest, this condition is extremely rare. Cases in which it is suspected nearly always prove to be caused by malignant growth. That an x-ray pleurisy should follow an irradiation of the abdomen is even more unlikely. The great majority of afebrile pleural effusions are cancerous in nature. Of course, there is a possibility that the pleural effusion is an independent disease in no way associated with the uterine enlargement. One can best answer this part of the query by quoting Richard Cabot, who always emphasized the fact that one disease was enough for a person to have at one time and that in the great majority of instances a single diagnosis would cover all signs and symptoms.

Additional information as to the actual nature of the effusion might be obtained by examining the pleural fluid for cancer cells, by injecting some into a guinea pig, and by removing the pleural fluid and then taking a roentgenogram of the lungs. This latter might reveal shadows suggesting either tuberculosis or a malignant condition. The absence of shadows does not rule out either disease.

TYPHOID IMMUNITY IN INFANT AND NURSING

To the Editor:—A patient developed typhoid between the third and fourth months of pregnancy. Subsequent to the delivery of an apparently healthy boy she was found to be a typhoid carrier. 1. Can the child have developed an immunity and, if not, at what age should typhoid immunization be started? 2. Is it safe to allow the baby to nurse?

D. M. Barringer, M.D., Lincoln, Ill.

ANSWER.—1. The child may have developed an immunity. Evidence for or against this fact might be obtained by actual tests of the child's antibody reactions as demonstrated by the ordinary Widal reaction. Another test using skin sensitivity has been suggested but is not in general clinical use. In this test local hypersusceptibility to typhoid bacillus protein is regarded as presumptive evidence of typhoid immunity.

2. If proper care of the nipples and ordinary cleanliness are employed, the child may be allowed to nurse. It is quite possible that the mother may cease being a carrier after a limited period. While about one third of recovered individuals are carriers for as long as three months, only 4 to 11 per cent, it is estimated, eliminate the bacilli indefinitely (more than three months) and so become classed as chronic carriers.

CONGENITAL HEMOLYTIC ANEMIA

To the Editor:—A primipara aged 28 who was given no antepartum care was delivered of a male baby by low forceps. An acute episode of congenital hemolytic anemia (jaundice) then developed. She had an enlarged spleen, severe microcytic normachromic anemia, a high white blood cell count and a continuous fever. In spite of daily pint blood transfusions after the fifth day, and later continuous blood transfusion, she died at the end of the tenth day. Twenty years previously she had had an attack similar to this which was relieved by transfusion. During the interim she had been in fairly good health. Splenectomy was planned for if the crisis was controlled. 1. What mechanism brings on these acute attacks when the patient is free from symptoms for years? 2. What possibility is there of this condition developing in the child? 3. What are the earliest signs or symptoms by which this condition may be detected in the child? 4. In Queries and Minor Notes for April 6 you say "splenectomy is indicated if acute attacks occur." What would have been the best method of controlling the phase in the case cited prior to splenectomy? 5. Is vitamin C of any value in these cases?

M.D., New York.

ANSWER.—1. The mechanism that brings on acute attacks in congenital hemolytic anemia is not understood. Such attacks may be spontaneous or precipitated.

2. In a family in which one of the parents is suffering from congenital hemolytic anemia an average of half of the children may be expected to be carriers of the disease.

3. The presence of the latent stage of congenital hemolytic anemia is characterized by increased fragility of the erythrocytes to hypotonic salt solution and by spherocytosis of the red cells. Spherocytosis is recognized by an increase in the volume-thickness index (Haden, *Am. J. M. Sc.* **188**:441 [Oct.] 1934). Excessive hemolysis of the red cells is associated with anemia, reticulocytosis and jaundice.

4. There is no way to control an acute hemoclastic crisis except by blood transfusions and splenectomy. Doan, Curtis and Wiseman (THE JOURNAL, Nov. 16, 1935, p. 1567) consider emergency splenectomy a life saving procedure in such cases.

5. There is no evidence that vitamin C is of any value in cases of this sort.

FREQUENCY OF URINATION IN YOUNG GIRL

To the Editor:—The answer to the question "Frequency of Urination in Young Girl" (The Journal, June 22, 1940, p. 2491) does not specifically discuss the most likely diagnosis in this case, namely, chronic granular urethritis. Folsom (ibid., Nov. 7, 1931, p. 1345), in his discussion of the glands of the female urethra, has pointed out that the characteristic inflammatory changes are by no means limited to adult women. Moore and I have published observations on the unsuspected common occurrence of granular urethritis in young girls characterized by disturbance of micturition with normal urine (Spence, H. M., and Moore, Halcuit: Female Urethra in Childhood, *Texas State J. Med.* **35**:234 [July] 1939, and Spence, H. M.: Granular Urethritis in Women, *J. Urol.* **43**:199 [Jan.] 1940). In the query the diurnal nature of the frequency and the absolutely normal urine would be more suggestive of urethral disease than of tuberculosis or a neurologic lesion. A urethroscopic examination with careful attention to the caliber of the urethra and search for the granular appearance of the mucosa and the presence of papillary or cystic masses is indicated. If the suspected lesion is found, simple urethral dilations will result in dramatic relief.

Harry M. Spence, M.D., Dallas, Texas.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS
BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, September 14, page 956.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Part III, Baltimore and New York during October and Boston during November. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written.* Various centers. Feb. 20. Final date for filing application is December 21. *Oral.* Cleveland, May 31-June 1. Final date for filing application is April 1. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* Chicago, Dec. 6-7. Applications for Group A must be on file not later than Nov. 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Chicago, Oct. 18-19. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville, Ky.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Part I Group B examinations, locally, Jan. 4, 1941, at 2:00 P. M. Final date for filing application is Oct. 5. Part II, Groups A and B, Cleveland, Ohio, June 1941, immediately prior to opening of A. M. A. meeting. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Cleveland, Oct. 5. *Written.* Various centers, March 8. *The only written examination during 1941.* Applications must be on file not later than Dec. 1. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Oral and written.* New Orleans, January 1941. Final date for filing application is November 15. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF PEDIATRICS: New York, March 30-31, following the Region I meeting of the American Academy of Pediatrics. Chicago, May 18, following the Region III meeting of the American Academy of Pediatrics. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, December 18-19. Final date for filing application is October 8. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: Boston, Sept. 26-29. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave., S.W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: *Oral and Written.* Chicago, February 1941. Applications must be on file not later than Oct. 15. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Wisconsin June Report

Dr. H. W. Shutter, secretary, Wisconsin State Board of Medical Examiners, reports the written and practical examination for medical licensure held at Milwaukee, June 25-27, 1940. The examination covered twenty subjects and included 100 questions. An average of 75 per cent was required to pass. Ninety-three candidates were examined, all of whom passed. Thirty-one physicians were licensed to practice medicine by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1940)	80
Loyola University School of Medicine		(1940)	85, 85, 87
Northwestern Univ. Medical School (1940)		80, 82, 83, 84, 84, 85,	86
Rush Medical College		(1939)	81, 82, 83, 84, 84
University of Illinois College of Medicine		(1940)	81, 82, 88
Harvard Medical School		(1939)	83, 86
University of Minnesota Medical School		(1939)	82, 84, (1940) 86
University of Oklahoma School of Medicine		(1939)	80
University of Oregon Medical School		(1936)	87
Marquette University School of Medicine		(1940)	80, 80, 82, 82, 82, 83, 83, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 85, 86, 86, 86, 87, 87, 87, 87, 87, 88, 89
University of Wisconsin Medical School		(1938)	83, 84, (1939) 76, 77, 79, 81, 81, 82, 82, 82, 82, 82, 82, 83, 83, 83, 83, 83, 83, 83, 83, 84, 84, 84, 84, 84, 85, 85, 85, 85, 85, 85, 86, 87, 87

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1938)	Arkansas
College of Medical Evangelists		(1936)	Michigan
Loyola University School of Medicine		(1929), (1939)	Illinois
Northwestern University Medical School		(1939)	Illinois
Rush Medical College		(1936)	Iowa
University of Illinois College of Medicine		(1914), (1924), (1937), (1939, 3)	Illinois
State University of Iowa College of Medicine		(1936)	California
Johns Hopkins University School of Medicine		(1932), (1936)	Maryland
University of Michigan Medical School		(1938)	Michigan
St. Louis University School of Medicine		(1938)	Missouri
Washington University School of Medicine		(1937)	Missouri
University of Nebraska College of Medicine		(1936), (1938)	Nebraska
University and Bellevue Hospital Medical College		(1922)	Missouri
University of Buffalo School of Medicine		(1932)	New York
University of Cincinnati College of Medicine		(1937)	Ohio
University of Oregon Medical School		(1935)	Illinois
University of Pittsburgh School of Medicine		(1936)	Minnesota
Vanderbilt University School of Medicine		(1935)	Tennessee
Marquette University School of Medicine		(1939)	S. Dakota
University of Wisconsin Medical School		(1936), (1938)	Minnesota, Illinois, (1937) Oregon

Puerto Rico March Report

Dr. O. Costa Mandry, secretary, Board of Medical Examiners of Puerto Rico, reports the written and practical examination for medical licensure held at San Juan, March 5, 1940. The examination covered nineteen subjects and included seventy-eight questions. An average of 75 per cent was required to pass. Eight candidates were examined, six of whom passed and two failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Tulane University of Louisiana School of Medicine		(1937)	75.6
Middlesex College of Medicine and Surgery		(1929)	75.1
University of Michigan Medical School		(1936)	84.2
University of Pennsylvania School of Medicine		(1938)	83.5
Université de Paris Faculté de Médecine		(1938)	75
Universidad Nacional Facultad de Medicina, México		(1934)	80.9

School	FAILED	Year Grad.	Number Failed
Midwest Medical College, Kansas City		(1935)	1
Université de Paris Faculté de Médecine		(1937)	1

Book Notices

Cancer: A Manual for Practitioners. The Committee on Publication [representing the Massachusetts Medical Society and the American Society for the Control of Cancer]: George W. Holmes, Chairman, Ernest M. Daland, M.D., Shields Warren, M.D., and Channing C. Simmons, M.D., editor. Cloth. Pp. 284, with 2 portraits. Boston: Massachusetts Department of Public Health, Division of Adult Hygiene, 1940.

This compact little volume, published by a committee representing the Massachusetts Medical Society and the American Society for the Control of Cancer, is notable for its unusual purpose and content. Written expressedly to present to the general practitioner a general survey of cancer together with information pertaining to the problem of early diagnosis and treatment, it serves also to stimulate an interest in the progress of cancer work and to point out the urgent need for an adequate program of control. It is of particular interest to practitioners in Massachusetts, since there is included an outline of the Massachusetts cancer program and a survey of the various facilities for diagnosis, therapy and research. In addition, distribution of this volume to practitioners of Massachusetts is made possible by funds obtained from the U. S. Public Health Service and by the Massachusetts branch of the Women's Field Army of the American Society for the Control of Cancer. The material shows careful arrangement and is commendable for its clarity and brevity. Each chapter is contributed by an individual particularly interested in the subject for review. The broad aspects of cancer are presented in the introductory chapters, which include a historical survey, an analysis of the epidemiologic aspects of cancer and a description of the principles of therapeutic procedures employed at the present time. The chapters which follow are devoted to the various types of cancer —classification being based on the site of origin of the lesion (cancer of the lip, cancer of the breast, cancer of the ovary). The leukemias, Hodgkin's disease and allied disorders also are considered. The chapters are short and convey the essentials of the subject under discussion. Since exhaustive dissertation is not within the scope of this book, it would be necessary to consult more complete textbooks for detailed information. The character of the book hardly permits review of various controversial opinions and ideas, although in some instances individual inclinations are reflected. On the whole, the material is adequately and conservatively treated. Valuable additional chapters for the practitioner contain suggestions for lay talks on cancer and an explanation of the purpose and results of activities for the control of cancer. The committee for publication has prepared a well integrated, practical manual which augments the educational features of any cancer control program.

Rural Health Work in Hungary. By Dr. B. Johan, Undersecretary of State. Publications of the State Hygienic Institute of Hungary, No. 9. Paper. Pp. 230, with 118 illustrations. Budapest, 1939.

Twelve years ago a complete system of medical care, both preventive and curative, was established for the rural areas in Hungary. This health organization centers around the State Institute of Hygiene, the establishment of which was prompted by grants from the Rockefeller Foundation, and through this institute official control has been provided for the preventive health services and for affiliation with the Green Cross Service, which corresponds to the American plan for public health nursing. Hungary has been divided into twenty-six districts, each with its chief health officer. Only physicians who have served as local health officers for not less than five years are eligible to this appointment. In 1938 there were 190 local health officers in Hungary who prior to such appointment must serve an apprenticeship as a community or village physician and must have passed the final examinations subsequent to taking a nine months special course for health officers. The actual health work in the villages is carried on by the village physicians, of whom in 1939 there were 1,193, an average of one for each 4,900 of the population. The duties of the village physicians include the practice of curative medicine and responsibility for the public health activities of the community. They are charged with the execution of measures to prevent the spread of communicable disease, control the water and food supply, supervise the health of children at school, issue certificates of death, participate in necropsies and direct and supervise the public health activities. The success of the program of health education depends largely on the ability of the village physician and the public health nurse. Health centers have been established in the rural areas where both curative and preventive services are provided. The author provides many interesting graphs and statistical tables portraying the rise and fall of disease in different parts of Hungary, especially in relation to the intensiveness of health education. There are included in this monograph plans of health centers and reproductions of posters used in the program of propaganda.

A Textbook of Surgery. By John Homans, M.D., Clinical Professor of Surgery. Compiled from Lectures and Other Writings of Members of the Surgical Department of The Harvard Medical School. With a Special Bibliographical Index. Fifth edition. Cloth. Price, $8. Pp. 1,272, with 530 illustrations by Willard C. Shepard. Springfield, Illinois & Baltimore: Charles C. Thomas, 1940.

This has been revised and brought down to date in many particulars. General surgical subjects such as repair of wounds, surgical bacteriology, technic, suppuration, trauma and specific diseases are discussed first. To each chapter there is attached a historical prologue which is both interesting and instructive. These historical sketches aid greatly in the proper introduction of the student to surgery. The anatomy of the locale under discussion is well described and frequently clarified by a simple line sketch. Diagnosis of surgical diseases together with etiology and pathology is treated in a thorough and scholarly manner. There is a trace of pedantism, as evidenced by a tendency to involved sentence structure and a rather stilted style of writing. In many portions, however, the flow of words is free and easy and is pleasantly received by the medical student. The greater portion of the book deals with specific surgical problems of the various bodily systems. One of the most excellent sections concerns thoracic surgery. The problem of empyema and pulmonary infection is discussed. The importance of postoperative pulmonary complications cannot be overemphasized as a cause of morbidity. These subjects are fully presented and represent a valuable educational source. Heparin is mentioned as a means of treatment of pulmonary embolism, indicating the authors' ability to keep this textbook completely modern. The chapters on neurosurgery, inspired as they were by Cushing, deserve mention. Anesthesia is another subject presented in a clear and scientific manner. As a textbook for general use by medical students, this volume is not surpassed by any other. The illustrations are usually graphic but, nevertheless, simple. A few illustrations are not well chosen. The pictures of basal and squamous cell carcinoma on page 197, for example, represent advanced stages of these diseases. They are likely to be misleading in that it is rare for the contemporary physician to see these diseases in such advanced stages. Such drawings have little place in the modern textbook, in which early diagnosis and treatment should be stressed. The general competence of the book is well exemplified by the large bibliographic index and the numerous references. Successful revision enables this book to continue as a useful teaching tool.

Traité d'ophtalmologie. Publié sous les auspices de la Société française d'ophtalmologie. Par MM. P. Bailliart, Ch. Coutela, E. Redslob, E. Velter. René Onfray: Secrétaire général. Tome VII: Neurologie (Fin); Chirurgie. Par MM. J. Bruneau et al. Cloth. Price, $10.50. Pp. 934, with 414 illustrations. Paris: Masson & Cie, 1939.

The seventh of this eight volume system appeared on schedule and properly resembles its predecessors in clothing and character. The first third of the volume is devoted to the concluding phases of ocular neurology with the following subdivisions: peripheral and central disturbances of the oculomotor apparatus by Velter of Paris, strabismus by Onfray of Paris, nystagmus by Coppez of Brussels, ocular disturbances of trigeminal origin by Cerise and Thurel of Paris, semeiology of ocular troubles in disturbances of the central nervous system by Velter of Paris, neurosurgical diagnosis of disturbances in the region of the chiasm by Vincent and Puech of Paris, and intracranial hypertension and cerebral tumors by Martel and Guillaume of Strasbourg. These chapters vary considerably, as is to be expected from a mélange of authors, but on the whole are well written and clear in context and contain some excellent illustrations.

The second two thirds of the volume is devoted to ocular surgery, divided as follows: surgical generalities by de Saint-Martin of Toulouse, the lids and conjunctiva by Duverger and Velter of Limoges and Paris, the lacrimal apparatus by Merigot de Treigny of Paris, the cornea, sclera and iris by Duverger and Velter, extracapsular extraction of cataract by Van Lint of Brussels, intracapsular extraction of cataract by de Saint-Martin of Toulouse, luxation of the lens by de Saint-Martin, detachment of the retina by Veil and Dollfuss of Paris, antiglaucomatous operations by Duverger and Veil, strabismus by de Saint-Martin and Onfray, enucleation by Carlotti of Nice, the orbit by Terrien of Paris, foreign bodies in the eye and orbit by Duverger and Velter, and prostheses by Bruneau and Charpentier of Paris. That is an enormous amount of surgery to try to compress into 530 none too large pages, especially when the descriptions are supposed to be encyclopedic in extent. This is probably the most spotty part of the entire system. Much of it is good, although too abbreviated, but some unfortunately falls below textbook level. However, the illustrations are excellent, especially those in the chapters by Duverger and Velter. The bibliography is rather weak and only too often purely Gallic in character. The book making and general ensemble are up to the standards set in the previous volumes.

Your Allergy and What to Do About It. By Milton B. Cohen, M.D., and June B. Cohen. Cloth. Price, $1.50. Pp. 177, with illustrations. Philadelphia, New York & London: J. B. Lippincott Company, 1940.

This book is written for the patient. Allergy holds a prominent position in the public eye and it requires more than a brief article to answer such questions as How are my symptoms produced? Can my allergy be cured? Hence this book. The authors' approach to the subject is biographic. Allergy has molded the lives of some famous men. Marcel Proust locked himself into a room where he could be relieved of asthmatic attacks and to amuse himself wrote several volumes that are classics. General William T. Sherman was comfortable when in the field but at home suffered from allergic attacks; he was sensitive to house dust. The French physician Charles Richet sailed on the yacht of the Prince of Morocco to experiment with the poisonous proteins of the sea anemone. His experimental animals remained healthy after the first injection of the protein, but a few minutes after the second injection one of them suddenly died. Richet inoculated a second experimental animal with egg albumin and it died after the second injection. Thus the dose which, according to the principle established by Pasteur in his experiments with rabies, should have protected the animals from harm had so changed their bodies as to remove protection altogether. Physicians then began to wonder about some of their patients who became ill a few days after injection

of diphtheria antitoxin; they saw some relation between this and the startling results of Richet's experiments. In a few years medical men began to relate such strange diseases as hay fever and asthma to anaphylaxis and at last bound together many strange complaints under the term "allergy" or altered reactivity. In their small book the authors explain how the symptoms of allergy are produced and how the diagnosis is made. Special attention is given to hay fever, asthma, eczema, allergic rhinitis and hives. The problem of treatment of allergic diseases as well as details of the pathogenesis are not well understood. Perhaps these problems may be solved from some physical or chemical discovery by workers in fields apparently remote from medicine but still pertaining to the workings of the living cell. Thus our understanding of allergy may be entirely changed and the appearance of the allergic state may become no more than an occasional curiosity. The family of allergic diseases may then become merely an interesting episode in medical history.

Complete Guide for the Deafened. By A. F. Niemoeller, A.B., M.A., B.S. With a foreword by Harold Hays, M.D., F.A.C.S. Cloth. Price, $3. Pp. 256, with one illustration. New York: Harvest House, 1940.

The number of people in the United States who suffer from impaired hearing has been variously estimated at from ten to seventeen million. Like many other statistical figures, this is probably inaccurate, for no one can ever know even the approximate number. However, those afflicted are doubtless in need of some such book as this, since they so often seem to be hopelessly engulfed in their wretched state and know not how to orientate themselves. While not "complete," these seventy-seven chapters consider the origin and kinds of hearing defects, the influence of heredity, drugs, disease, old age, and mental attitudes, reeducation, employment, recreation, legislation, social considerations, personal adjustments, and hearing aids. An effort is made to overcome the so-called social stigma, the tendency to withdraw from one's fellows and the all important element of maladjustment. Advice is given to parents as to their attitude toward deafened children, how they can enjoy the radio, movies, sermons, public lectures, music, conversation with friends and the telephone. In such a small volume it is impossible, of course, to do more than touch on many phases of this problem, but the author has succeeded in covering much ground, and he attempts to lead the deafened to a richer, fuller life. Fraudulent and harmful aids and devices such as "ear oil" are explained and condemned in an effort to spare the victims agony of mind and spirit and depletion of purse. The author's style is fluent and conversational, which makes for easy reading. From a medical point of view the facts are accurate in the main, and no attempt has been made to overeducate the reader.

Le guide therapeutique du médecin praticien. Par Jean Trabaud, professeur de clinique médicale, et J. R. Trabaud. Tome I: Les infections et les intoxications endogènes et exogènes. Tome II: Les maladies de l'appareil respiratoire. Tome III: Les maladies du tube digestif et de ses annexes. Tome IV: Les maladies des appareils cardio-vasculaire et urinaire. Les maladies du sang. Tome V: Les maladies nerveuses et mentales. Préface de M. le Professeur Tanon. Paper. Price, Tome I, 55 francs; Tome II, 43 francs; Tome III, 48 francs. Pp. 288; 210; 243; 284; 253. Paris: Vigot Frères, 1940.

The task the authors have set themselves is a pretentious one indeed; namely, to encompass the entire field of therapeutics in a manual consisting of eight small format volumes, viz. (1) infections and intoxications; (2) diseases of the respiratory organs; (3) diseases of the digestive tract; (4) cardiovascular and urinary diseases; (5) nervous and mental diseases; (6) diseases of children; (7) eye, ear, nose and throat diseases, and (8) genito-urinary and cutaneous diseases. The last three still await publication. A concise description of symptomatology of each disease is followed by recommendation of a suitable dietary regimen, hygienic measures, general and local treatment, including physical therapy, irradiation and spas; prescriptions follow. As the authors claim that the majority of patients prefer proprietary medicines to officinal preparations, the first group dominates the picture. As to the spas, only French watering resorts are mentioned. A cursory perusal of the five volumes has disclosed several omissions, for instance the use of sulfanilamide in the treatment of gonorrheal arthritis or of thiamine, pituitary or x-rays in the treatment of herpes zoster. Not less than thirty-five pages is allotted to prescriptions for various types and phases of tuberculosis. There are many therapeutic suggestions which do not coincide with generally accepted points of view in this country. As countless French proprietary drugs are specified and only French resorts are recommended for balneologic treatment, the work may be fitted to the needs of French colleagues but cannot be recommended for practical use by American physicians.

Illustrative Electrocardiography. By Julius Burstein, A.B., M.D., Associate Electrocardiographer and Chief of the Cardiac Clinic, Morrisania City Hospital, New York. Originally written by the late Joseph H. Bainton, A.B., M.D., and Julius Burstein, A.B., M.D. Second edition. Cloth. Price, $5. Pp. 292, with 106 illustrations. New York & London: D. Appleton-Century, Incorporated, 1940.

This edition, like the preceding one, is based on a description of illustrative electrocardiograms. In this edition the author has added the subject of chest leads and included a verbatim copy of the report of the American Heart Association Committee on precordial leads. The method of presenting the electrocardiograms is commendable, and it is regrettable that a large number of errors nullify its usefulness. The following are some of the typical errors:

Plate 17 shows a sinus arrhythmia with nodal escape and dissociation and not a wandering pacemaker. It is questionable whether the attempt to locate the origin of the premature systole as stated on page 49 is correct. In plate 20 the author mistakes a sinus P wave occurring at the proper time for a premature P wave. In plate 21 the author overlooks a pulsus trigeminus. In plate 22 the author fails to draw attention to the effects of the premature systole on the contour of the succeeding beat. In plate 26 the author fails to recognize that the first premature complex is a fusion beat. In plate 27 the author labels P waves without evidence for doing so. The curves in plates 27 and 28 should better have been called supraventricular tachycardia. The diagnosis in plate 30 is problematic, and it would have been better to leave this illustration out. The author should have pointed out in plate 31 that, in addition to the short paroxysms, there are single premature ventricular extrasystoles. In plate 33 the author should have labeled the auricular waves as F instead of P waves. Plate 37 would be considered impure flutter. In plate 40 the author overlooks premature systoles in leads 1 and 3. It is doubtful whether the slight variation in the PR interval in plate 44 is worth mentioning. Plate 47 is complex and might have been left out, and in lead 1 are two instances in which there is 1:1 conduction. In plates 48, 87 and 88 the presence of intraventricular block might be questioned. Plate 49 is misdiagnosed; it is an instance of second degree auriculoventricular block with a Wenckebach phenomenon and with nodal escapes (the second and sixth complexes). The subject of T wave abnormalities on pages 134 and 135 is poorly presented; the author does not distinguish between the S-T segment and the T wave; the idea that T wave size is related to vigor of the heart is erroneous. The interpretation of plate 54 is wrong. There is no reason to suspect a myocardial infarct in plate 56. The prolonged duration of QRS in plate 57 is overlooked. The statement that the high voltage in plate 65 indicates a good myocardial vigor is without foundation. This is true also of the statement regarding QRS in plate 66 *A*. In plate 74 the term "old coronary occlusion" is a bad one. Plate 75 shows a partial auriculoventricular block with a Wenckebach phenomenon and not a complete auriculoventricular block. In plate 77 the so-called premature contraction in lead 1 is an extracardiac artefact. In plate 79 all the premature systoles are auricular in origin. The author overlooks the fact in plate 82 that many of the premature extrasystoles are blocked, giving rise to the pauses. In plate 84 the pauses identified as sino-auricular block are really due to blocked auricular premature systoles. Plate 89, when handled to conform with the normal electrocardiogram, shows left ventricular preponderance. The P wave changes of the dominant beats in plate 91 are due to the effect of the auricular premature systoles. Plate 92 *A* is probably an instance of complete auriculoventricular dissociation. No useful purpose is served in showing the original lead 4 in plate 96, since this lead is no longer utilized.

Further, a number of the illustrations are complex. Considering the handling by the author, they could have been

omitted. Attention is drawn to the foregoing errors in order to demonstrate the need of care in the presentation of such electrocardiograms for the use of physicians. A great deal of harm in educating the ordinary reader can be done by loose writing and by erroneous concepts which serious students in the field would not make. Because of these circumstances, and despite the excellence of the reproductions, this book cannot be recommended.

Biochemistry of Disease. By Meyer Bodansky, Ph.D., M.D., Director of the John Sealy Memorial Laboratory and Professor of Pathological Chemistry, University of Texas School of Medicine, Galveston, and Oscar Bodansky, Ph.D., M.D., Lecturer in Biochemistry, Graduate Division, Brooklyn College, New York. Cloth. Price, $8. Pp. 684, with 72 illustrations. New York: Macmillan Company, 1940.

The tremendous strides made in recent years in the development of scientific medicine are reflected in this book. It is apparent that the rapid progress has depended to a great extent on the more complex biochemical studies and that a sound knowledge of this phase of medicine is essential for further elucidation of disease and its treatment.

This book is apparently not intended to be a textbook of clinical biochemistry but rather a critical review of the investigational work in this field. Much of the investigational work presented in this volume is still controversial and the authors have wisely refrained from making their statements dogmatic and conclusive although it is possible that some readers would desire more definite statements. The evaluation of the data in this book is uniformly sound. The scope of the book is wide and the enormous amount of information is presented in a clear, concise and logical manner. Obviously the authors could not go into great detail on many of the subjects, but readers may easily follow their interest in any subject through the use of the ample bibliography. Each chapter starts with a brief but concentrated discussion of the normal biochemical relationships of the particular subject in view. Then with each subdivision there is another brief introduction of the fundamental concepts before the conditions found in disease are presented. In this way the reader's memory is constantly refreshed and his understanding of the subject matter improved. There are included in the book discussions on subjects which have been recently expanded and which are of the utmost importance in modern medicine. These chapters are on the biochemical aspects of the endocrines, vitamins, problems of gynecology and obstetrics, and neurologic and psychiatric disorders. These features will be greatly appreciated by physicians and students because of the widespread interest in these subjects and their growing importance in medicine.

While this book is not a reference work for physicians to use in administering practical therapy or a course in laboratory technic for the diagnosis of disease, it is an excellent means by which the modern physician may keep abreast of the scientific developments in disease, which might be quite impossible if the data were to be obtained directly from the literature.

Liquor: The Servant of Man. By Walton Hall Smith and Ferdinand C. Helwig, M.D. Cloth. Price, $2. Pp. 273. Boston: Little, Brown & Company, 1939.

In this book there is an attempt to make an unbiased and scientific survey of the real effects of alcohol on the human system. The authors believe that the facts concerning alcohol have been buried under a haze of misconception. The history of drinking, the physiologic effects of alcohol and the relation between alcohol and disease are discussed. Some information concerning the psychology of drinking is included. Startling are some of the statements which are made:

> There has been found no evidence that prolonged and copious use of alcohol causes any disease.
>
> It is the present opinion of many authorities that, instead of causing arteriosclerosis, alcohol can act to retard it.

The statement is also made that alcohol is an active ingredient in all intoxicants and that its toxicity is increased and not decreased by aging or by congenerics or substances mixed with it to make it more palatable. The book is written for the average person and not for the problem drinker. The average individual will find much of interest in it.

Poisons: Their Isolation and Identification. By Frank Bamford, B.Sc. With a foreword by Professor Sydney Smith, M.D., F.R.C.P., Regius Professor of Forensic Medicine, University of Edinburgh, Edinburgh. Cloth. Price, $4. Pp. 344, with 21 illustrations. Philadelphia: Blakiston Company, 1940.

Here is a book that should be well received by the chemist who is occasionally called on to do the kind of work indicated by the title. Written by a man who was intimately acquainted with the problems that confront the chemist in medicolegal laboratories, the many methods and tests must have been subjected to practical laboratory trials. To the toxicologist it will be useful as a compact and systematic arrangement of the more important poisons with which he may come in contact. The chapter on the isolation and identification of alkaloids is especially good. The many tests that depend on color reactions are open to criticism. In the minds of many, the best that can be said for such tests is that they are indicative. Microchemical tests, especially descriptions of crystals obtained by microsublimation, could have been given more attention. Photomicrographs, though space consuming, would have been of assistance to the chemist not actively engaged in this kind of work.

Chemotherapy and Serum Therapy of Pneumonia. By Frederick T. Lord, M.D., Member of the Board of Consultation, Massachusetts General Hospital, Boston, Elliott S. Robinson, M.D., Ph.D., Director, Division of Biologic Laboratories, Massachusetts Department of Public Health, and Roderick Heffron, M.D., Medical Associate, The Commonwealth Fund, New York. Cloth. Price, $1. Pp. 174, with 9 illustrations. New York: Commonwealth Fund; London: Oxford University Press, 1940.

This small volume, simply and interestingly written, with an eye to detail, is a mine of information which summarizes present opinions concerning the best methods to be employed in the treatment of lobar pneumonia. In addition it gives adequate brief summaries of existing knowledge concerning the etiology, epidemiology, diagnosis and past and present views on the prognosis of lobar pneumonia. It is the opinion of the reviewer that the authors have presented the respective merits of antipneumococcus serum or sulfapyridine in a critical and fair manner. While he might argue with the authors over the proposed criteria which are set up as indications for combined serum and chemotherapy, he believes that this is one of the books that should have a place on every physician's desk.

Mammalian Genetics. By William E. Castle, Research Associate in Genetics, University of California, Berkeley. Cloth. Price, $2. Pp. 169, with 131 illustrations. Cambridge: Harvard University Press, 1940.

In this small book Professor Castle, who was a pioneer and is a recognized authority in the field of mammalian genetics, has summarized what is known about the inheritance of characters in laboratory and domestic mammals. Especially interesting is a table of comparative gene mutations found in the rabbit, house mouse, Norway rat, black rat, field mouse and guinea pig. His discussions of sex differentiation and sex determination are brief but they are good summaries of what is known about these topics. In his chapter on maternal inheritance he takes to task those who would attribute all inheritance to the genes. There is only an occasional reference to the genetics of human characters. The book is highly recommended to those who do not have the time to read the detailed papers in this important field. To those working in the field it is a welcome summary and synthesis.

Asthma and the General Practitioner. By James Adam, M.A., M.D., Surgeon-In-Charge, Asthma Clinic, Stobhill Hospital, Glasgow. With foreword by James Bridie, M.D. Cloth. Price, $2. Pp. 157. Baltimore: William Wood & Company, 1939.

One can briefly summarize the good points of this book by saying that the author insists that the asthmatic patient be given a complete medical workup and should not be looked on as only a problem in allergy but a real medical problem, taxing the ingenuity of even the most facile mind. However, what the author apparently believes are newly discovered truths have been known and practiced by American physicians for years in the treatment of asthma. Many dogmatic positive statements are made which are not supported by scientific observation or laboratory investigations. It is insufficient to become emotionally aroused about a method of treatment without adducing scientific proof.

Annual Report for the Year 1939, Central Narcotics Intelligence Bureau, Egyptian Government. Paper. Pp. 185, with illustrations. Bulâg, Cairo: Government Press, 1940.

The Annual Report of the Central Narcotics Intelligence Bureau for 1939 contains numerous interesting accounts of investigations by which the Intelligence Bureau has been able to seize purveyors of narcotics in Egypt, the narcotics being principally hashish and opium. There are specific reports of cases in which three doctors and two chemists were concerned with the sale of narcotics. Most interesting was the discovery of a great amount of opium smuggled into Egypt in the stomach of camels, the opium being kept in a zinc container which the camel swallowed. It has been determined that it will be necessary to install x-ray equipment in the custom station through which 30,000 camels pass each year in order to make a routine study of a certain percentage of the camels in order to detect the presence of opium.

Your Child's Development and Guidance Told in Pictures. By Lois Hayden Meek, Ph.D. Cloth. Price, $2. Pp. 166, with 163 illustrations by Lucia Manley. Philadelphia, New York, Toronto & London: J. B. Lippincott Company, 1940.

This picture book for parents portrays and discusses the life of children from 1 to 6 years old. Growth, daily routine, eating, elimination, relations with family and other children, training, fear and illness are all discussed. However, a chapter on play is omitted and, according to the author, is being reserved for a book of its own. Proper methods, pitfalls and problems are portrayed from which the parent is to take only what concerns his particular child. Thus this book demonstrates that children of the same age are not all alike and that most children are capable of doing a number of things for themselves and of performing physical feats parents do not often credit them with the ability to do. Because the text which accompanies these excellent pictures, drawings and charts is poorly written, reading and comprehension is often difficult. However, the material presented is sound, and the author also includes her references and a list of other books for parents.

A Textbook of Histology. By Harvey Ernest Jordan, A.M., Ph.D. Professor of Anatomy and Director of the Anatomical Laboratories, University of Virginia, Charlottesville. Eighth edition. Cloth. Price, $7. Pp. 690, with 609 illustrations. New York & London: D. Appleton-Century Company, Inc., 1940

The general plan of this book remains unchanged; the author has, however, incorporated important additions to the subject as recorded in the recent literature, as well as many new illustrations. Experience has shown that teachers of histology prefer to use their own laboratory outlines. The author has therefore eliminated the chapters on directions for laboratory work and on histologic technic, which is taken up in detail in many special books on technical methods. References to the literature are recorded as footnotes and reassembled in a bibliography at the end of the book, thus making it convenient for the student who desires to pursue further the study of particular subjects. The numerous illustrations are well adapted to the text and some of them are in color.

Practical Dietetics With Reference to Diet in Health and Disease. By Alida Frances Pattee. Twenty-second edition. Cloth. Price, $3. Pp. 868, with illustrations. Mount Vernon, N. Y.: The Author, 1940.

What foods are most effective in increasing hemoglobin? What foods supply potassium? This book answers these and many other questions in its tables, which list foods under such headings in the order of their importance. Indeed, an extensive appendix is composed entirely of tables of food values, including those which are rich in minerals, tables listing foods which are highest in cellulose, highest in cholesterol, foods that will produce flatulence, foods which contain nicotinic acid, foods which are acid forming and foods which contain the various vitamins. Diet therapy is discussed by specialists who go into great detail about the dietetic treatment of diabetes mellitus, arthritis and gout, obesity, emaciation, Addison's disease, tuberculosis, constipation, nephritis, the anemias, heart disease, pregnancy, typhoid and infant feeding. Among the details on the preparation of foods for both the sick and the well person, it is shown how to prepare salads, cook vegetables and make different kinds of bread, soups and other dietary products. This book is a storehouse of information. The arrangement, as in previous editions, follows the "Curriculum Guide for Schools of Nursing" issued by the National League of Nursing Education. Parts of this edition have been entirely rewritten.

Let's Talk About Your Baby. By H. Kent Tenney, Jr., M.D., F.A.A.P., Associate Professor of Pediatrics, University of Wisconsin Medical School, Madison. With a foreword by Dr. Joseph Brennemann, Chief of Staff, Children's Memorial Hospital, Chicago. Second edition. Cloth. Price, $1. Pp. 115, with illustrations. Minneapolis: University of Minnesota Press, 1940.

The first edition of this book was published privately by Dr. Tenney for his patients. Written in the conversational manner, it covers the subjects of furniture, clothing, feeding, training and health for the baby's first year as well as most of the relatively unimportant things which worry many mothers. The baby's point of view, a common sense attitude and the availability of the doctor are all stressed. The manner of presentation and the large amount of information included make this book enjoyable and valuable reading. It is, indeed, a perfect book for parents.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Evidence: Osteopath as Expert Witness in Malpractice Suit Against Physician. — The plaintiff on March 3, 1936, was struck on his head by a falling tile. He was taken to the defendant physician, who examined him and, finding no objective evidence of injury, gave him some medicine and told him not to go back to work until he felt better. Soon thereafter he commenced to suffer pain in his head, accompanied by nausea and dizziness. He returned to work the next day but on the day thereafter his pain increased and he again visited the defendant, who gave him some liniment and advised him not to work until the next week. After attempting unsuccessfully to work the following week he again returned to the defendant, who took his blood pressure and found it above normal. At the time of his next visit to the defendant, after working for one week on the latter's advice, his blood pressure was higher. On the request of the plaintiff's wife that a roentgenogram be taken of the plaintiff's head the defendant caused such to be made, but what it disclosed does not appear in the published report. The plaintiff was hospitalized for thirteen days during which time two lumbar punctures were performed on him by the defendant. Later he brought suit against the physician for malpractice, alleging that he had sustained permanent injuries as the result of the defendant's negligence in failing to take roentgenograms promptly, in failing to diagnose correctly his injury as one of skull fracture and in failing to apply the usual and recognized treatment for skull fracture, namely, immobilization in bed with ice packs to the head and heat to the feet, and for the cerebral hemorrhage which developed. The trial court directed a verdict for the defendant and from a judgment thereon the plaintiff appealed to the court of appeals of Ohio, Lorain County.

At the trial the plaintiff endeavored to establish negligent conduct on the part of the defendant by offering the testimony of two osteopaths as expert witnesses as to the treatment which they would have rendered to the plaintiff if they had been called to treat him. However, on the motion of the defendant, the trial court withdrew this testimony from the consideration of the jury because the testimony of the osteopaths did not indicate that they possessed any knowledge whatever as to the standard of skill, care and diligence ordinarily exercised by practitioners of medicine and surgery. The action of the trial court met with the full approval of the court of appeals. In malpractice actions, said the court, the care, skill and diligence exercised by the defendant is to be judged by that standard of care which ordinarily is exercised by physicians and surgeons of the same school of medi-

cine in the same or similar communities. The court relied for its decision on 21 R. C. L. 383, section 28, which states:

> In an action for malpractice a physician or surgeon is entitled to have his treatment of his patient tested by the rules and principles of the school of medicine to which he belongs, and not by those of some other school, because a person professing to follow one system or school of medicine cannot be expected by his employer to practice any other, and if he performs the treatment with ordinary skill and care in accordance with his system, he is not answerable for bad results.

Recognizing the fact that the injury which the plaintiff claimed he had sustained was of such a nature as not to be understood by lay witnesses but required a high degree of expertness for its diagnosis and treatment, the court could find in the record no evidence from which the jury could determine the standard of care, skill and diligence by which the defendant physician's conduct was to be judged. Furthermore, the trial court properly refused to allow the plaintiff to call the defendant as an adversary party for the purpose of cross examining him to establish the standard of care, skill and diligence by which the defendant's conduct should be judged and then by further cross examination to establish that the acts of the defendant complained of were negligent. In the judgment of the court, the plaintiff had even failed to present credible evidence that he had sustained a skull fracture.

Accordingly, the court of appeals held that the trial court had properly directed a verdict for the physician and so it affirmed the judgment in his favor.—*Forthofer v. Arnold (Ohio), 21 N. E. (2d) 869.*

Medical Practice Acts: Surgical Diathermy by Naturopath Constitutes Unlawful Practice of Medicine.—The defendant, a licensed naturopath, removed "a lump or growth," which he diagnosed as "cancer," from the bottom of Mrs. Larkin's right foot by cauterization with "a surgical diathermy" apparatus, an apparatus commonly used by surgeons. According to the defendant, "electricity . . . was turned on the target [presumably the growth on the patient's foot] through a copper wire connected with a diathermy machine and from one-half to an inch from the target" and the heat emanating therefrom on "the target" produced a burn about 1 inch (2.5 cm.) in diameter and about one-eighth inch (0.32 cm.) deep, which destroyed the growth. For the performance of this procedure the naturopath was convicted of practicing medicine without a license, in violation of the Arizona medical practice act, and was sentenced to the penitentiary. He then appealed to the Supreme Court of Arizona.

The naturopath contended that it is not a statutory offense in Arizona to practice medicine and surgery without a license so to do. Since every one at common law, he argued, could practice medicine or the healing art, it is not a crime so to practice without a license unless some particular statutory provision makes it so. The section of the Arizona medical practice act pertinent to this matter merely provides: "Any person who practices, or attempts to practice, without having a valid, recorded certificate, shall be guilty of a felony . . . " (Revised Code, 1928, section 2560, as amended, Laws, 1935, chapter 99, section 2). This, the naturopath contended, is inadequate to make it a statutory offense to practice medicine and surgery without a license. The Supreme Court, however, held that the provision in question did make it a statutory offense to practice medicine and surgery without a license. This provision is a part of a section of the medical practice act and, in the Revised Code, 1928, it appears under the title "Medicine and Surgery." Provisions corresponding to this particular section appeared in the Revised Statutes, 1913, under the title "Practice of Medicine" and expressly made it a misdemeanor for any person to practice "medicine or surgery" without being licensed so to do. The Revised Code, 1928, said the court, was the result of studies made by a code commissioner whom the legislature prior to 1928 directed to codify the then existing laws and expressly instructed not to make any change in existing laws, but only to harmonize where necessary, reduce in language and remove inconsistencies (Laws, 1925, chapter 35, section 3). The court, concluded therefore, that the omission of the words "medicine and surgery" following the prohibition against unlicensed practice in the section in question had been done merely to eliminate redundancy of language. The effect of the omission was not to exempt one from punishment who practices medicine without a license.

The court was next called on to determine whether or not the acts of the naturopath were within the scope of the license to practice naturopathy which he possessed. In the practice of naturopathy in Arizona, said the court, no medicine may be used and the treatment must be nonsurgical. The naturopathic practice act of Arizona (Laws, 1935, chapter 105) authorizes persons possessing the qualifications therein prescribed, when duly licensed by the board of naturopathic examiners, to practice naturopathy. Section 5 of that act reads:

> Naturopathy Defined. For the purpose of this Act, Naturopathy, which includes all forms of physiotherapy, is hereby defined to be: A system of treating the abnormalities of the human mind and body by the use of drugless and nonsurgical methods, and includes the use of physical, electrical, hygienic, and sanitary measures incident thereto.

This section permits a naturopath to use electricity in treating the human body and mind but prohibits him from performing surgical operations. His methods must be nonsurgical and drugless. The operation performed by the defendant was with an instrumentality in use by surgeons, and so it was conclusively surgical in its nature. If the defendant had used a scalpel to cut out the growth instead of burning it out, the act would have been no more surgical. While he had the right to use electrical heat in the practice of naturopathy, he had no right to use it to perform a surgical operation. There was nothing in the evidence to indicate that the defendant carelessly or mistakenly administered an overdose of heat or that he burned his patient by accident. On the contrary, the evidence showed that he intentionally and purposely applied the electricity to destroy the lump on the patient's foot by burning it out. He adopted the surgeon's method of curing cancer, the only one, said the court, that has been discovered to date.

For the reasons stated above, the judgment of conviction was affirmed.—*Nethken v. State (Ariz.), 104 P. (2d) 159.*

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Cleveland, Oct. 6-10. Dr. William P. Wherry, 107 South 17th St., Omaha, Secretary.

American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Excelsior Springs, Mo., Sept. 26-28. Dr. James R. Bloss, 418 Eleventh St., Huntington, W. Va., Secretary.

American Clinical and Climatological Association, White Sulphur Springs, W. Va., Oct. 28-30. Dr. Francis M. Rackemann, 263 Beacon St., Boston, Secretary.

American College of Surgeons, Chicago, Oct. 21-25. Dr. Frederic A. Besley, 40 East Erie St., Chicago, Secretary.

American Public Health Association, Detroit, Oct. 8-11. Dr. Reginald M. Atwater, 50 West 50th St., New York, Executive Secretary.

American Roentgen Ray Society, Boston, Oct. 1-4. Dr. Carleton B. Peirce, Royal Victoria Hospital, Montreal, Canada, Secretary.

American Society of Anesthetists, New York, Oct. 10. Dr. Paul M. Wood, 745 Fifth Avenue, New York, Secretary.

American Society of Tropical Medicine, Louisville, Ky., Nov. 12-15. Dr. E. Harold Hinman, Malaria Control Division, Wilson Dam, Ala., Secretary.

Association of Military Surgeons of the United States, Cleveland, Oct. 10-12. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

Central Society for Clinical Research, Chicago, Nov. 1-2. Dr. Carl V. Moore, Washington University School of Medicine, St. Louis, Secretary.

Clinical Orthopaedic Society, Milwaukee and Madison, Wis., Oct. 18-19. Dr. Myron O. Henry, 825 Nicollet Ave., Minneapolis, Secretary.

District of Columbia, Medical Society of the, Washington, Oct. 15-17. Mr. Theodore Wiprud, 1718 M St., N.W., Washington, Secretary.

Indiana State Medical Association, French Lick, Oct. 29-31. Mr. Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Cleveland, Oct. 14-18. Dr. W. B. Peck, 27 East Stephenson St., Freeport, Ill., Managing Director.

Michigan State Medical Society, Detroit, Sept. 24-27. Dr. L. Fernald Foster, 2020 Olds Tower, Lansing, Secretary.

Mississippi Valley Medical Society, Rock Island, Ill., Sept. 25-27. Dr. Harold Swanberg, 510 Maine St., Quincy, Ill., Secretary.

Nevada State Medical Association, Las Vegas, Oct. 11-12. Dr. Horace J. Brown, 120 North Virginia St., Reno, Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 28-Nov. 1. Dr. J. D. McCarthy, 107 South 17th St., Omaha, Secretary.

Pacific Coast Society of Obstetrics and Gynecology, San Francisco, Nov. 6-9. Dr. T. Floyd Bell, 400 Twenty-Ninth St., Oakland, Calif., Secretary.

Pennsylvania, Medical Society of the State of, Philadelphia, Sept. 30-Oct. 3. Dr. Walter F. Donaldson, 500 Penn Ave., Pittsburgh, Secretary.

Southern Medical Association, Louisville, Ky., Nov. 12-15. Mr. C. P. Loranz, Empire Bldg., Birmingham, Ala., Secretary.

Southern Minnesota Medical Association, Red Wing, Sept. 23. Dr. Harold C. Habein, 102 Second Ave., Rochester, Secretary.

Tri-State Medical Society, Shreveport, La., Sept. 25-26. Dr. Ralph H. Riggs, 624 Travis Street, Shreveport, La., Secretary.

Vermont State Medical Society, Rutland, Oct. 9-10. Dr. B. F. Cook, 154 Bellevue Ave., Rutland, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1930 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

60:249-470 (Aug.) 1940

Calcium Fractions in Infantile Spasmophilia. J. P. Garrahan and G. F. Thomas, Buenos Aires, Argentina.—p. 249.
Pneumococcus Typing in Cases of Pneumonia in Infants and in Children. J. G. M. Bullowa, New York, and H. Simon, Newark, N. J.—p. 256.
*Treatment of Megacolon with Acetylbetamethylcholine Bromide. J. L. Law, Ann Arbor, Mich.—p. 262.
Oral Conditions of Children in Relation to State of General Health and Habits of Life. R. F. Sognnaes and Ruth L. White, Boston.—p. 283.
Bullous Schick Reactions: Their Occurrence During Acute Infectious Diseases. A. E. Fischer, B. Rubin and C. K. Greenwald, New York.—p. 304.
Reasons for High Carbohydrate Requirement of Infants and Children. W. Heymann, Cleveland.—p. 316.
Hospital Infections: III. Ward Study for Sources of Infection. A. P. Long, C. F. McKhann and Lucile L. Cheney, Boston.—p. 322.
*Value of Banana and Banana Powder in Treatment of Infants and Children Having Diarrhea: Two Year Clinical Study. I. J. Wolman and R. L. Roddy, Philadelphia.—p. 333.
Influence of Syphilis on Intelligence of Children. R. L. Jenkins, Warwick, N. Y.; A. W. Brown and Lillian E. Cisler, Chicago.—p. 341.
Clinical Picture of Tuberculosis in Children. Edith M. Lincoln, New York.—p. 371.

Acetylbetamethylcholine Bromide for Megacolon.—Law states that the neurogenic theory of megacolon is supported by the clinical successes following interruption of the sympathetic nerves or the use of cholinergic drugs which inactivate the autonomic nervous system. Acetylcholine increases the parasympathetic nerve impulses and stimulates peristalsis of the colon. There is no record of the successful use of any cholinergic drug in the management of megacolon. As a remedial agent acetylcholine is limited because, although physiologically potent, its instability and its frequently alarming toxic effects discourage its use. Eight years ago Cowie carefully adjusted doses of acetylcholine and a derivative, acetylbetamethylcholine, and in combination with conservative medical measures designed to promote colonic movement caused an infant suffering from typical megacolon to recover completely. This served as a stimulus for the use of acetylcholine or its derivatives in the treatment of such disorders. Acetylbetamethylcholine bromide has the advantageous pharmacologic properties of acetylcholine but is more stable in the body and produces a definite and continued stimulation of the parasympathetic nerves, usually without untoward toxic manifestations. It slows the cardiac action, lowers blood pressure, dilates peripheral blood vessels, stimulates sweat glands and increases intestinal tone and peristalsis. It may constrict the bronchioles and incite an asthmatic attack, or in large doses it may produce abdominal pain and vomiting. Its effects can be abolished by the subcutaneous injection of 1/400 grain (0.0001625 Gm.) of atropine sulfate. The drug is fairly stable in tablet form and is suitable for oral administration. With this preparation a method giving highly satisfactory results has been evolved since 1936 for the treatment of megacolon patients. The average initial dose of acetylbetamethylcholine bromide is 0.1 Gm., increased, if necessary, in two or three days to 0.2 Gm. and again after several days by the addition of 0.1 to 0.2 Gm. in midafternoon. Usually 0.2 Gm. after breakfast is effective without the afternoon dose. As the drug becomes effective (from five to ten days) enemas are discontinued, though liquid petrolatum is continued as a mild mechanical aid. When a dosage which produces one or two stools daily is determined, the patient is discharged, usually with instructions to take 0.2 Gm. of the drug one half hour after breakfast, from 1 to 2 tablespoons of liquid petrolatum every evening and an enema in the event of constipation or distention. Recently prostigmine bromide has been used as an augmentor of acetylbetamethylcholine bromide, as it prevents the destruction of the active principle, acetylcholine, of the latter drug. In moderate dosage prostigmine is safe, it does not disturb blood pressure or heart action and its use may be beneficial. The author used derivatives of acetylcholine in the treatment of megacolon for the following groups of patients: those in whom satisfactory initial drug therapy was abandoned in favor of sympathectomy, those treated with subcutaneous injections for brief periods with little benefit, patients experiencing obstinate relapse after sympathectomy, which was relieved by drug therapy, and patients whose condition was successfully managed by medical therapy.

Banana and Banana Powder for Diarrhea.—Wolman and Roddy used mashed bananas or banana powder in the treatment of ninety-seven patients, from 1 week to 10 years of age, suffering from diarrhea. The results are compared with a control group of eighty similar children treated by a variety of recognized therapies. Diarrhea was defined as the passage of loose, watery, mucopurulent or bloody stools, usually with an increase in frequency and persisting for longer than twenty-four hours. The diarrheas were classified as specific, parenteral and unknown. The outcome was considered good if complete recovery had taken place by the end of a week. Forty-nine of the eighty control patients and fifty-four of the treated group were less than 1 year of age. In the control group recovery was good among seventeen parenteral, sixteen unknown and twenty specific diarrheas; the respective poor recoveries were five, eight and eleven. Among the banana diet group of patients thirteen with parenteral, thirty with unknown and twenty with specific diarrheas had good recoveries, while five, eleven and fourteen had poor recoveries. There were three deaths among the control and four among the banana diet group of children. There were no significant differences within the two groups as regards age, etiologic factors, severity of infections, state of nutrition and mortality rates. Banana feeding was as effective as the older and more usual feeding regimens. It was well taken and the patients receiving it were usually relieved of hunger, tenesmus and abdominal discomfort and passed semiformed stools.

American Journal of Surgery, New York

49:201-400 (Aug.) 1940. **Partial Index**

Cervical Spine Trauma Associated with Injury of Head and Shoulder Girdle: Coleman's Syndrome. J. M. Meredith, University, Va., and E. Grantham, Louisville, Ky.—p. 203.
Secondary Osteo-Arthritis Following Fractures of Ankle. R. W. Lewis and W. C. Graham, New York.—p. 210.
Tumors Related to Cartilaginous Growth. H. L. Lloyd, Brownsville, Texas.—p. 221.
Complications of Empyema in Children. C. W. Lester, New York.—p. 227.
*Evaluation of Sorbitol as Dehydrating Agent. J. Browder, Brooklyn, and F. H. Bragdon, Pittsburgh.—p. 234.
*Mesenteric Venous Occlusion: Clinical Entity. M. J. Brown, Davenport, Iowa.—p. 242.
Reducing Mortality of Perforated Appendicitis: Study of 100 Cases. A. S. Jackson and R. Perkins, Madison, Wis.—p. 250.
Spontaneous Reduction of Acute Intussusception in Children: Its Incidence and Significance in Diagnosis and Treatment of Recurrent Intussusception. L. Goldman and R. Elman, St. Louis.—p. 259.
Postoperative Concentration of Bile Salts in Human Bile. C. H. Greene, R. Hotz, R. F. Carter and J. R. Twiss, New York.—p. 264.
When to Operate and Why, and What Operation to Do in Acute Cholecystitis. R. S. Fowler, Brooklyn.—p. 281.
Ovarian Neoplasms: Their Pathologic and Surgical Significance. V. S. Counseller, Rochester, Minn.—p. 284.
Hysterostomatomy: Dührssen's Incision: Preliminary Study. I. A. Siegel, Baltimore.—p. 290.
Consideration of Suture Problem. J. Burke, Buffalo.—p. 303.
Recurrence in Segmental Enteritis Following Radical Resection. L. Felger and H. L. Schenk, Los Angeles.—p. 307.
Treatment of Fractured Clavicle in Presence of Kyphosis by Modified Clavicular Cross. G. V. Webster, San Francisco.—p. 316.
Ammonia as Cell Proliferant and Its Spontaneous Production from Urea by Enzyme Urease. W. Robinson, Washington, D. C.—p. 319.
Valves and Anastomoses of Hemorrhoidal and Related Veins. T. F. Reuther, Chicago.—p. 326.
Polycystic Kidney Disease. H. Hausman, New York.—p. 335.

Sorbitol as Dehydrating Agent.—According to Browder and Bragdon, sorbitol, a modified monosaccharide ($C_6H_{14}O_6$) derived from the reduction of dextrose and levulose, may be employed as an osmotic dehydrating agent and diuretic. The

authors investigated its effect on the cerebrospinal fluid pressure, pulse, respiration, blood pressure and psychologic state in persons with and without disease of the central nervous system. Thirty-three patients with various diseases of the intracranial structures were studied, with five patients as controls who had neither clinical evidence of a pathologic process implicating the nervous system nor increase in the intracranial tension as measured by the cerebrospinal fluid pressure. A total of fifty intravenous injections of sorbitol was given to thirty-eight patients. Clinical improvement as evidenced by a more lucid state of consciousness and relief of headache was noted in 54 per cent. Detailed observations concerning the cerebrospinal fluid pressure, pulse, blood pressure, respirations and psychologic state were recorded in ten experiments. Included in the detailed studies were two patients without evidence of disease of the central nervous system. In each experiment on the two subjects a slight reduction in cerebrospinal fluid pressure was effected and sustained for more than two hours. In four of the five patients in whom an elevation in cerebrospinal fluid tension was demonstrated, the injection of sorbitol produced an immediate reduction in the pressure followed by a secondary rise to a level higher than that observed prior to the injection. In a patient who had sustained a recent craniocerebral trauma there was an immediate progressive rise in cerebrospinal fluid pressure to twice the original level following the injection. The authors conclude that in general the action of sorbitol as measured by the reduction in cerebrospinal fluid pressure is comparable to dextrose but less satisfactory than sucrose. The frequent occurrence of chills following the intravenous injection of this chemical militates against its use as a dehydrating agent.

Mesenteric Venous Occlusion.—According to Brown the literature contains reports of 772 cases of mesenteric vascular occlusion, most of them arterial occlusion. The author believes that venous occlusion is a separate clinical entity. This study was made in 101 cases of venous occlusion taken from the literature, two from the Guthrie Clinic and one from the author's practice. Seventy-one of the 104 had a fatal outcome. Of the patients who recovered, 57.5 per cent had been ill for nearly two weeks before operation. This does not support the calculations of Warren and Eberhard that the mortality rate increases from 25 per cent in the first twelve hours to 83.3 per cent after four days. An investigation on the relationship of the extent of the involved mesentery and intestine to the outcome of the disorder revealed that the average length of the bowel involved in twenty-two of thirty-three patients who recovered was 38 1/10 inches. Of thirty-seven patients who died, an average of 102 2/5 inches of the intestine was infarcted. It is generally conceded that symptoms of arterial occlusion are fulminating and those of the venous type are less so. The onset of pain may be rapid or slow. It may be colicky. The contrast between the severity and persistence of the pain and the paucity of physical observations was the most significant diagnostic feature of mesenteric venous occlusion. Vomiting is more frequent in the arterial than in the venous lesion. Constipation is considered more common than diarrhea. Distention is regarded by most observers as a late manifestation and is not relieved by bowel movement or enemas. Shock is considerable in fulminating cases and is proportional to the degree of mesenteric involvement. The temperature at the onset is either normal or subnormal but within a few hours may rise to 103 F. The pulse rate may be slow at the onset but varies with the temperature and degree of shock. Patients with a rapid onset and severe pain will show varying degrees of pallor, but patients with venous thrombosis and a slow insidious onset may show no complexion changes until the occlusion becomes complete and the epigastric pain severe. Tenderness is much less than would be expected in proportion to the pain and extent of the lesion. There is a general abdominal tenderness without localization, especially in the venous cases, until the occlusion becomes complete. The tenderness in the advanced cases tends to be epigastric. Rigidity is generally lacking in the early cases, but as the lesion advances it becomes more definite. Peristaltic sounds are not likely to be so loud and gurgling as in cases of mechanical obstruction, but, when the entire small bowel is affected by the thrombotic process, absence of peristaltic sounds is the rule and distention is more likely to occur. There may be no evidence of gross blood in the stools but laboratory tests would undoubtedly show its presence more often than is reported. At the onset the white blood count may be normal, but as the lesion progresses leukocytosis is the rule. X-ray examination of the abdomen can be expected to show evidence of intestinal obstruction in a large percentage of cases. Although enterostomy has been advocated by some, most writers agree that primary resection of the involved portion of the intestine is preferable. It has been pointed out that resection of from 3 to 6 inches on either side of the area of infarction is necessary to prevent extension of thrombosis. In cases due to overindulgence in alcohol, resection may not be necessary to effect a cure. In cases in which thrombosis results from infection such as appendicitis, Jones advocates the Wilms-Braun operation of ligation of the ileocecal vein to prevent the extension of thrombosis. The author reports histories of three typical cases.

Archives of Dermatology and Syphilology, Chicago

42:239-398 (Aug.) 1940

Massive Arsenotherapy in Early Syphilis by Continuous Intravenous Drip Method: Preliminary Work with Neoarsphenamine. G. Baehr, New York.—p. 239.
Id.: Technic. W. Leifer, New York.—p. 245.
Id.: Toxicologic Manifestations. L. Chargin, New York.—p. 248.
Id.: Clinical Considerations. H. T. Hyman, New York.—p. 253.
Id.: Résumé of Serologic Observations. J. F. Mahoney, Staten Island, N. Y.—p. 262.
Id.: Follow-Up Observations at New York Hospital. B. Webster, New York.—p. 264.
Id.: Follow-Up Observations at Bellevue Hospital. E. Thomas, New York.—p. 267.
Id.: Arsenic Excretion in Urine and Concentration in Blood. H. Sobotka, W. Mann and Edith Feldbau, New York.—p. 270.
Id.: Public Health Aspects. J. L. Rice, New York.—p. 283.
Effect of Ointment Bases on Skin: I. Results of Patch Tests with Commonly Used Ointment Bases. L. F. Ray, Portland, Ore., and I. H. Blank, Boston.—p. 285.
Experiments in Poison Ivy Sensitivity: Effects of Specific Injections on Level of Sensitivity to Quantitative Patch Tests and on Clinical Susceptibility. S. Greenberg and Ella D. Mallozzi, New York.—p. 290.
Verruca Plantaris. E. A. Oliver, Chicago.—p. 302.
Gentian Violet in Sabouraud's Medium for Isolation of Pathogenic Fungi. S. S. Epstein and F. D. Snell, Brooklyn.—p. 308.
Acute Interstitial Myocarditis Following Administration of Arsphenamines. C. E. Brown and D. H. McNamara, Santa Barbara, Calif.—p. 312.
Exudative Chronic Discoid and Lichenoid Dermatitis (Sulzberger and Garbe): Treatment of Five Patients. Frances Pascher, Brooklyn.—p. 322.
Injuries of Mouth Caused by Teeth. D. W. Montgomery, San Francisco.—p. 333.
Neurofibromatosis Associated with Carcinoma of Breast and Pregnancy. H. Charache, Brooklyn.—p. 337.

Canadian Medical Association Journal, Montreal

43:1-98 (July) 1940

Therapeutic Value of Adrenal Cortical Hormones in Traumatic Shock and Allied Conditions. H. Seiye, Christianne Dosne, Lucy Bassett and Joan Whittaker, Montreal.—p. 1.
Reduction of Mortality from Experimental Traumatic Shock with Adrenal Cortical Substances. P. G. Weil, B. Rose and J. S. L. Browne, Montreal.—p. 8.
Boeck's Disease (Sarcoid): Its Clinical Groups and Diagnosis. J. H. Palmer, Montreal.—p. 11.
Weil's Disease (Report of Fatal Case with Autopsy). A. J. Blanchard and C. H. Jaimet, Toronto.—p. 19.
Acromioclavicular Dislocation. A. A. Appell, Toronto.—p. 23.
Congenital Abnormalities of External Ear. H. O. Foucar, London, Ont.—p. 26.
Technic for Pneumo-Encephalography. H. H. Hepburn, Edmonton, Alta.—p. 28.
Two Fractures of Neck of Femur. J. H. Couch, Toronto.—p. 31.
Gallbladder Surgery. F. B. Gurd, Montreal.—p. 34.
Maternal Mortality. W. G. Cosbie, Toronto.—p. 38.
*Diphtheria Immunization. E. M. Worden, Montreal.—p. 44.
Alcohol and Automobile Driving. A. T. Cameron, Winnipeg, Man.—p. 46.
The Psychoneuroses of War. G. F. Boyer, Toronto.—p. 53.
Perisympathetic Injection Treatment of Asthma. H. M. Wilensky, London, Ont.—p. 59.
Cesarean Section. N. Shaul, Toronto.—p. 63.

Diphtheria Immunization.—Worden points out that at the Alexandra Hospital for infectious diseases in Montreal it has been the routine to record on admission whether that patient had or had not been immunized to diphtheria. The 9,295 admissions to the hospital from 1932 to 1938 inclusive were studied with reference to diphtheria immunization. The patients were suffering from scarlet fever, measles, diphtheria, whooping cough, parotitis, chickenpox and erysipelas. Of all the patients less

than 12 years of age who made up 80 per cent of the admissions admitted in 1932, 16.9 per cent had been immunized. This figure rose to 53.5 per cent in 1938. In 1938 only 9 per cent of all children less than 1 year of age and only 25 per cent of those less than 2 years of age had been immunized. In Montreal in 1933 there were 297 cases of diphtheria with eighteen deaths and in 1938 there were 227 cases and twenty-six deaths. Immunization of infants at the age of 6 months should be particularly encouraged and this should be followed by a further dose of toxoid at about 5 years of age. Diphtheria does occur among patients who have had a full immunization course. There have been four such cases at the Alexandra Hospital during the last three years. These cases probably fall into that group of children who after three or four years require "reimmunization" with a single dose of toxoid (from 0.25 to 1 cc.).

Connecticut State Medical Journal, Hartford

4:437-500 (Aug.) 1940

Allergy in General Practice. J. S. Harris, New Haven.—p. 437.
The Connecticut Way: The State Medical Society's Participation in Public Health. J. I. Linde, New Haven.—p. 443.
That Secondary Adenoid and Tonsil Operation. W. H. Turnley, Stamford.—p. 447.
Unusual Case of Pancreatic Abscess. P. J. Steincrohn, Hartford.—p. 450.

Indiana State Medical Assn. Journal, Indianapolis

33:397-440 (Aug.) 1940

Modern Trends in Therapeutics. R. A. Solomon, Indianapolis.—p. 397.
Management of Complicated Thyroid Disease. G. Link, Indianapolis.—p. 402.
Endemic Asthma Due to Soy Bean Dust. S. S. Rubin, Gary.—p. 406.
Hemorrhage During Pregnancy. C. P. Huber, Indianapolis.—p. 408.
Nasal Surgery, the Internist and the Patient. J. J. Littell, Indianapolis.—p. 412.
Calcification of Pericardium. P. D. Crimm, J. D. McDonald and H. N. Cookson, Evansville.—p. 415.
Supervision of Normal Infant by the Family Physician. H. E. Miller, Seymour.—p. 419.
Gallbladder Disease. G. A. May, Madison.—p. 421.

Journal of Bone and Joint Surgery, Boston

22:525-894 (July) 1940. **Partial Index**

Fractures of Neck of Femur in Childhood. J. C. Wilson, Los Angeles.—p. 531.
Congenital Flatfoot: New Surgical Approach. J. W. White, Greenville, S. C.—p. 547.
Tuberculosis of Large Long Bones of Extremities. W. B. Carrell, Dallas, Texas, and H. M. Childress, Jamestown, N. Y.—p. 569.
Operative Procedure for Treatment of Hammer Toe and Claw Toe. R. G. Taylor, Sheffield, England.—p. 608.
Pseudofractures: Manifestation of Nonsuppurative Osteomyelitis. J. B. Weaver and C. B. Francisco, Kansas City, Mo.—p. 610.
Method of Fixation for Fracture of Clavicle. G. Murray, Toronto.—p. 616.
"Dorsal Bunion": Its Mechanics and Operative Correction. P. W. Lapidus, New York.—p. 627.
*Osteoid Osteoma: Further Experience with This Benign Tumor of Bone, with Special Reference to Cases Showing Lesion in Relation to Shaft Corticles and Commonly Misclassified as Instances of Sclerosing Nonsuppurative Osteomyelitis or Cortical Bone Abscess. H. L. Jaffe and L. Lichtenstein, New York.—p. 645.
Herniation of Intervertebral Disk with Referred Sciatic Symptoms: Study of Forty Cases. H. F. Johnson, Omaha.—p. 708.
Surgical Treatment of Degenerative Arthritis of Knee Joint. G. E. Haggart, Boston.—p. 717.
Interposition of Sesamoids in Metacarpophalangeal Dislocations. P. D. Nutter, Detroit.—p. 730.
Spontaneous Hemarthrosis Due to Synovial Granuloma. J. K. Stack, Chicago.—p. 735.
Orthopedic Research in North America: Survey of the Research Committee of the American Orthopedic Association. J. S. Barr, Boston; P. C. Colonna, Oklahoma City, and A. R. Shands Jr., Wilmington, Del.—p. 752.

Osteoid Osteoma.—Jaffe stated in 1935 that osteoid osteoma began its development in the spongy bone. Jaffe and Lichtenstein show that it can originate also, if not within the substance of bone cortex, at least on its periosteal or medullary surface. Their present thirty-three cases include thirteen instances in which the lesion developed in the shaft cortex of a long bone. These lesions, like those in spongy osseous areas, were misinterpreted as instances of chronic osteomyelitis or of osseous abscess. More particularly the cases in which the lesion was in the shaft cortex had been misclassified as representing so-called "sclerosing nonsuppurative osteomyelitis" or else "intracortical bone abscess." The authors interpret this lesion anatomically as a benign osseous neoplasm. They believe that a great many cases which in the past have been interpreted as osteomyelitis with annular sequestrum, chronic bone abscess, osteomyelitis with cortical osseous abscess, sclerosing nonsuppurative osteomyelitis, osteomyelitis chronic from the beginning and the like actually belong in the category of osteoid osteoma. That is, they have as their common anatomic basis a distinctive benign osteoid and bone-forming tumor of slow and limited growth which in the course of its development may provoke reactive perifocal new bone formation, sometimes of considerable extent. Much of the misunderstanding of the condition has resulted from concentrating attention on this perifocal reaction instead of on the lesion proper. Unless the latter is removed (preferably intact in its bed of bone) and submitted for microscopic study, the true significance of the case may be missed, as it usually is. The osteoid osteoma proper is usually indicated roentgenographically by a relatively radiolucent or rarefied area or, if it has become substantially ossified, it may appear as a relatively radiopaque nidus. In the cortex of a long bone it may be difficult to distinguish the shadow of the osteoid osteoma if the reactive cortical thickening is considerable or if the lesion has become ossified, as its shadow may be dominated by that of the thickened cortex. Because the roentgenogram has these two aspects, cases are incorrectly labeled. The disorder has a predilection for adolescents and young adults, principally from 10 to 25 years of age. The presenting symptom is localized pain of at least several months' duration. Surgical excision of osteoid osteoma with some of the surrounding bone resulted in clinical cure with prompt and often dramatic relief of distressing pain. During their experience of seven years they have encountered no recurrences.

Journal of Experimental Medicine, New York

72:99-216 (Aug.) 1940

Propagation of Vaccinia Virus in Rabbit Fetus. F. W. Gallagher and O. C. Woolpert, Columbus, Ohio.—p. 99.
Transmissible Agent (Theiler's Virus) in Intestines of Normal Mice. P. K. Olitsky, New York.—p. 113.
Infectious Myxomatosis of Rabbits: II. Demonstration of Second Soluble Antigen Associated with the Disease. J. E. Smadel, S. M. Ward and T. M. Rivers, New York.—p. 129.
Constituents of Elementary Bodies of Vaccinia: II. Properties of Nucleic Acid Obtained from Vaccine Virus. C. L. Hoagland, G. I. Lavin, J. E. Smadel and T. M. Rivers, New York.—p. 139.
Renal Clearance of Hemoglobin in Dog. J. V. Monke and C. L. Yuile, Rochester, N. Y.—p. 149.
Primary Pulmonary Coccidioidomycosis: Experimental Infection with Coccidioides Immitis. A. E. Cronkite and A. R. Lack, San Francisco.—p. 167.
Identity of "Inhibitor" and Antibody in Extracts of Virus-Induced Rabbit Papillomas. W. F. Friedewald, New York.—p. 175.
Liberation of Renin by Perfusion of Kidneys Following Reduction of Pulse Pressure. K. G. Kohlstaedt and I. H. Page, Indianapolis.—p. 201.

Journal-Lancet, Minneapolis

60:339-378 (Aug.) 1940

The Problem of Diabetes. W. G. Richards, Billings, Mont.—p. 355.
The Physician and the Public Health Program. G. W. Anderson, Minneapolis.—p. 360.
Decompression of Obstructed Intestine by Manipulation Under Ether and Pentobarbital Sodium Anesthesia: Experimental Study. L. Sperling and A. Kremen, Minneapolis.—p. 365.
Ovarian Hemorrhage as Cause for Acute Abdominal Symptoms. C. O. Rice, Minneapolis.—p. 369.
The Physical Education Teacher's Responsibility for Health Instruction. Mabel E. Rugen, Ann Arbor, Mich.—p. 371.

Journal of Nervous and Mental Disease, New York

92:141-280 (Aug.) 1940

Extrapyramidal Function. F. A. Mettler, Augusta, Ga.—p. 141.
Left-Sided Weakness, Blood Pressure Difference Between Two Arms and Left Optic Atrophy: New Clinical Syndrome? F. E. Weatherby and N. H. Wiley, El Paso, Texas.—p. 151.
Prolonged Coma After Insulin Hypoglycemia: Clinical Features and Treatment. D. Goldman, Cincinnati.—p. 157.
VII. Speech Studies in Cretins: Speech Sounds. S. L. Schreiber, I. P. Bronstein and A. W. Brown, Chicago.—p. 169.
Insulin Therapy in Schizophrenia and Reticulo-Endothelial System. G. M. Davidson, Ward's Island, N. Y.—p. 193.
Artificial Fever Therapy in Multiple Sclerosis: Study of Fifty-One Cases. A. E. Bennett and M. D. Lewis, Omaha.—p. 202.

Journal of Urology, Baltimore

44:125-246 (Aug.) 1940

*Pyelonephritic Injuries to Kidney and Their Relation to Hypertension. E. G. Crabtree, Boston.—p. 125.
Epithelial Tumors of Bladder. J. E. Ash, Washington, D. C.—p. 135.
Prostatic Calculi: Treatment by Subtotal Perineal Prostatectomy. R. B. Henline, New York.—p. 146.
Carcinoma of Prostate: Comparative Study of Modes of Treatment. R. W. Barnes, Los Angeles.—p. 169.
Prostatic Obstruction in Negroes. E. Burns, New Orleans.—p. 177.
*Prophylaxis and Medical Management of Calcium Urolithiasis: Role of Quantity and Precipitability of Urinary Calcium. R. H. Flocks, Iowa City.—p. 183.
Treatment of Resistant Infection in Urinary Tract. E. N. Cook, Rochester, Minn.—p. 191.
Papillary Cystadenoma of Kidney: Report. N. J. Heckel and H. V. Gould, Chicago.—p. 200.
Etiology of Multilocular Cysts of Kidney. A. B. Hepler, Seattle.—p. 206.
Anomalous Relationship Between Ureter and External Iliac Artery. J. E. Dees, Durham, N. C.—p. 207.
Supervoltage Radiation in Treatment of Bladder Tumors. F. H. Colby, Boston.—p. 216.
Uretero-Intestinal Implantation: Preliminary Report. H. J. Jewett, Baltimore.—p. 223.
Benign Cystadenoma of Bladder: Probably of Urachal Origin. F. C. Hamm, Brooklyn.—p. 227.
Subserial Examination of Endoscopically Resected Prostatic Tissue for Latent Carcinoma. S. E. Kramer and J. S. Ritter, New York.—p. 234.
Congenital Absence of Testis: Report of Seven Cases of Monorchidism. V. S. Counseller, D. R. Nichols and H. L. Smith, Rochester, Minn.—p. 237.
Observations on Site of Action of Sulfapyridine in Gonorrhea. R. M. Nesbit, Ann Arbor, Mich.—p. 242.

Pyelonephritis and Hypertension.—According to Crabtree, the demonstration that in about one half of the patients who die of hypertension pyelonephritic changes are found at necropsy, the clarification (through animal research) of the problem of deleterious effects of injured renal tissue in producing hypertension through some blood-borne substance that is elaborated by the diseased kidney and the recent recognition of an improvement in blood pressure following nephrectomy for chronic renal infectious disease have stimulated the study of renal deficiency and hypertension. The immediate result has been a rush to apply the new information with the danger that renal tissue that can ill be spared may be sacrificed. Aside from the clinical cases whose final fate is not yet known, evidence to support destruction of a portion of the renal tissue of a hypertensive patient is based only on animal experimentation and necropsy. The entire history of pyelonephritis has not yet been adequately covered by clinical surveys to indicate what have been the health conditions and the duration of life of affected patients. The author agrees with those observers who consider pyelonephritis a progressive disease of slow development, the end result of which is not apparent for many years, and that the apparent recovery from the acute phase of the disease is misleading. Blood pressure readings for thirty cases of severe pregnancy pyelonephritis from ten to eighteen years between the infection and the survey reveal that: 1. Seven cases which were intensively studied showed severe degrees of renal damage, as indicated by intravenous phenolsulfonphthalein excretion, intravenous pyelography, urea clearance concentration and dilution tests, and nonprotein nitrogen determinations. 2. Only two of the thirty patients showed hypertension. One of them, who had a normal blood pressure at the time of the study, has since shown hypertension after a summer of athletic activity. 3. Hypertensive tendencies among the seven patients intensively studied were not in proportion to the degree of renal deficiency demonstrated at the stage of the natural history of pyelonephritis at which the study was made. 4. Hypertension is not the rule in severely injured pregnancy kidneys after a lapse of ten or more years from the initial injury of patients who show reasonable degrees of health. This does not imply that these patients may not be hypertensive at some later date. A study of forty-five patients examined from five to ten years after the initial injury (the pregnancy infection) revealed that: 1. Many of the patients showed evidences of renal damage, even though no pus, albumin or infection was present. 2. There are evidences of renal damage following the initial infection in all types of patients. There may have been a slight preponderance of such damage in the severe group. In a few cases labeled mild, the renal damage was most severe. 3. Of three patients whose pyelonephritis was complicated by toxemia two were dead at five years and the other showed marked evidence of renal deficiency with hypertension. 4. Nonprotein nitrogen readings were elevated only among the toxemic patients. 5. The excretion of intravenously administered phenolsulfonphthalein showed that excretion was delayed in the second and third fifteen minute intervals. The result was flattening of the normal curve. The first fifteen minute output was usually below 25 per cent. Total excretion for an hour was usually normal. 6. The ability to concentrate the urine was subnormal for the group. The urine of only seven patients could be concentrated to 1.025. 7. All patients with pyelonephritis who had toxemia and six without complications showed hypertension at the time of the examination. 8. Five of the forty-five patients had renal stones. 9. In four instances there was such poor filling of the pelves and ureters that intravenous urography did not demonstrate the condition of the tract. One or both kidneys of five patients showed irregularity of the calices suggestive of contracture of the cortex. Inflammatory changes in the pelves and ureters were common. 10. Total renal deficiency was present in seven of the eleven cases studied.

Prophylaxis and Medical Management of Calcium Urolithiasis.—Flocks states that previous work emphasized the importance and significance of the role of urinary calcium in the pathogenesis of calcium urolithiasis and indicated that the latter condition was to be modified depending on the urinary calcium. It was shown that the normal daily urinary calcium is approximately from 90 to 150 mg. on a neutral ash diet which is low in calcium and phosphorus. Marked increase in the intake of calcium and phosphorus raises the urinary calcium to from 300 to 350 mg. daily. Acid ash diets or increased vitamin D intake bring about only slight rises in the urinary calcium of the normal individual. However, certain changes in the body mechanism (body immobilization, the early stages of certain bone conditions, hyperthyroidism, hyperparathyroidism and early intrinsic renal changes) are associated with increased urinary calcium excretion. There is a large group of individuals in whom the exact cause of high urinary calcium excretion is undetermined. These individuals make up approximately 60 per cent of patients with calcium stones. Marked intrinsic renal damage, the later stages of certain bone diseases and hypoparathyroidism present low urinary calcium excretions. On the basis of studies on the quantitative variations in urinary calcium excretion and the finding that large fluid intake lowered the urinary calcuim concentration without significantly altering the daily urinary calcium excretion, regimens for the prophylaxis and medical management of calcium urolithiasis were outlined. They depended on (1) ruling out and treating all other factors present, (2) determining the urinary calcium excretion, (3) if the urinary calcium was high, searching for and removing the cause if possible; forcing fluids to lower urinary calcium concentration, giving relatively low calcium and phosphorus intake, using acid ash diets and vitamin D intake with caution since increased urinary calcium resulting from their use counteracts the beneficial actions of lowered urinary p_H, avoiding urinary tract infection and when the urinary calcium returns to a normal or low value getting rid of any stone nuclei which may have been formed by placing the patient on a special regimen and (4) if the urinary calcium is low or normal forcing fluids to lower the urinary calcium concentration and using an acid ash diet and acidifying drugs if lowering of the urinary p_H is obtained. The author felt that a more thorough knowledge of the effect of treatment on the urinary calcium precipitability was necessary before more satisfactory results could be obtained and reasons for failures ascertained. The amount of calcium salts that will precipitate from any given sample of urine will vary according to many factors, but it can be determined rather roughly by the following method: One hundred cc. of freshly voided urine is divided into two portions after the p_H has been determined. In one the concentration of calcium is obtained and the other is thoroughly mixed with 1 Gm. of finely divided calcium phosphate for ten minutes, filtered and the calcium concentration obtained. The two concentrations are then compared. The urinary calcium precipitability is then expressed as minus the milligrams of calcium which will precipitate from the urine when it is mixed with calcium

phosphate. A minus value indicates that calcium will precipitate from the urine and a positive value that calcium phosphate will dissolve in the urine under these conditions. Studies of this type have been carried out on nineteen normal individuals and five patients with renal stone. The urine of the normal individual under normal conditions has shown a precipitability of from minus 2 to 8. When the calcium intake has been lowered and the urine concentrated this has been changed to a plus 1 to 3. In contrast the precipitability values of a patient with many stones were from minus 11 to 16. Dilution lowered the precipitability but never changed it to a plus quantity. Thus far the method has proved valuable in evaluating the significance of urinary calcium precipitability in calcium urolithiasis and in studying and following the effects of therapy.

Laryngoscope, St. Louis

50:585-702 (July) 1940

Vitamins and the Ear, Nose and Throat. I. H. Jones, Los Angeles.—p. 585.
Pathologic Changes in Peripheral Auditory Mechanism Due to Avitaminoses (A, B Complex, C, D and E). W. P. Covell, San Francisco.—p. 632.
Vitamin B and Other Measures in Treatment of Deafness. J. H. Childrey, San Francisco.—p. 648.
Recognition, Treatment and Prevention of Hearing Impairment in Children. S. J. Crowe, Baltimore.—p. 658.
Irradiation Treatment of Hyperplastic Lymphoid Tissue. C. F. Burnam, Baltimore.—p. 663.
Histologic Studies of Eustachian Tube of Individuals with Good Hearing. L. Polvogt and D. C. Babb, Baltimore.—p. 671.
Applied Biochemistry in Etiology and Treatment of Seasonal Hay Fever. D. C. Jarvis, Barre, Vt.—p. 676.

Maine Medical Association Journal, Portland

31:213-234 (Aug.) 1940

Surgical Treatment of Varicose Veins. J. M. Parker, Portland.—p. 213.
Attendant Nurses. A. Worcester, Boston.—p. 218.
Geriatrics in Country Practice. A. J. Fuller, Pemaquid.—p. 222.

Michigan State Medical Society Journal, Lansing

39:533-612 (Aug.) 1940

Skin Disease on Hands. C. G. Lane, Boston.—p. 549.
*Erysipelas: Sulfanilamide Treatment. F. H. Top, D. C. Young and H. T. Mernaugh, Detroit.—p. 557.
Neoprontosil in Treatment of Acute Upper Respiratory Infections. R. M. Atchison, Northville.—p. 560.
Sodium Morrhuate: Severe Reaction to Injection. M. Kadin, Calumet.—p. 561.

Erysipelas: Sulfanilamide Treatment.—Beginning with May 1937 and extending to April 1, 1939, Top and his associates treated cases of erysipelas admitted to their hospital with sulfanilamide. They compare these with cases treated with antitoxin during a period of about the same length just prior to May 1937. The number of patients treated with antitoxin was seventy-six and the number treated with sulfanilamide was 135. They observed that the proportion of cases that showed no spread was twice as great among those treated with sulfanilamide as among those given antitoxin. The proportion of cases with slight spread was about the same for the two groups, but moderate spread was noted twice as frequently among the antitoxin treated as among the sulfanilamide treated. Marked spread was noted among 10.5 per cent of antitoxin treated, whereas none of the patients receiving sulfanilamide showed this degree of extension. A marked difference was noted in the number of febrile days following institution of treatment with antitoxin or sulfanilamide. The average number was 6.1 days for the former compared to 2.6 days for the latter. The number of days in the hospital for the antitoxin treated group was 14.3 days and for the sulfanilamide treated group 7.5 days. This difference is a distinct advantage to the patient and his purse. In a hospital where a vast majority of patients are indigent or semi-indigent, the saving in the cost of hospitalization to the city is tremendous. The proportion of complications occurring in the antitoxin treated cases was 21.1, compared to 11.3 in the sulfanilamide treated group. If two accidental deaths were removed from the sulfanilamide group, the fatality rates for the antitoxin and sulfanilamide groups would be about the same. It is remarkable that no infant has died since sulfanilamide has replaced antitoxin. The dose of sulfanilamide used in the treatment of erysipelas is comparatively small. About one half to three fourths of a grain of sulfanilamide per pound of body weight daily is administered for a period of from four to six days. This amount rarely gives a blood sulfanilamide level exceeding 5 mg. per hundred cubic centimeters. A large initial dose consisting of one third of the daily dose may be given at four hour intervals day and night. Infants demand slightly higher amounts per unit of body weight. Elderly persons must be carefully watched because kidney elimination may be impaired. The blood picture should be closely followed and a complete blood count should be made every other day. The authors conclude that the use of sulfanilamide has proved of distinct value in the treatment of erysipelas.

Military Surgeon, Washington, D. C.

87:89-196 (Aug.) 1940

Foundation of American Meteorology by the United States Army Medical Department. E. E. Hume.—p. 89.
Modern Treatment of Syphilis. A. J. Greco.—p. 119.
A Medical Observer with the French. E. Ortion.—p. 126.
First Aid versus Subsequent Treatment. W. W. Lasher.—p. 129.
Suggested Changes in Preparation and Distribution of Medical Records. N. W. White.—p. 133.
*Transportation of the Wounded by Plane. F. Schmidt.—p. 136.
Transition of Civilian Dentist to Dental Officer. R. W. Force.—p. 141.
Medicine of the Future. H. Pleasants Jr.—p. 144.
Short Wave Diathermy. F. H. Krusen.—p. 158.
Experience with Medical Service During First Army Maneuvers of 1939. J. L. Kantor.—p. 163.
Dental Surgeon with Combat Troops. J. H. Jaffer.—p. 171.
Surgeon LaFayette Guild, Medical Director of the Army of Northern Virginia. J. M. Phalen.—p. 174.

Transportation of the Wounded by Plane.—According to Schmidt, German ambulance planes have been put into operation in appreciable number on the Eastern Front. The traveling speed of the large medical planes is 230 kilometers an hour. In contradistinction to all land transportation the plane maintains its speed without interruptions from takeoff to landing. Airplane transportation is superior to all other methods, because, while flying, jarring of the patient rarely causes pain and the transportation time is short. If taking the wounded to and from the flying field could be disregarded, the limits to the possibilities for air transportation could be widened even further than was actually the case in Poland. The trimotor passenger plane as an ambulance plane must be considered a lucky choice. Four removable stretcher racks in the open space in the cabin carried eight stretchers. The racks are fastened rigidly to the wall of the plane and permit no motion in any direction, except for elasticity. No necessity for springs has been felt either in squalls while in flight or when landing. Short leather straps keep the stretchers from slipping. Lying in pairs, one beside or above the other, each patient is easily reached from the central aisle. There is enough room to change a bandage while in flight, observe the patient's face, pass refreshments or give injections. The attending physician finds a good supply of syringes and cardiac and sedative preparations, also a dressing kit, sterile gauze, splints and padding material. The relatively large number of spinal injuries has made it necessary to include rubber or glass bedpans. They are now standard ambulance equipment. Since the wounded are very susceptible to cold, the planes are equipped with cabin heat of the same type used in passenger planes. Combining several airplanes in one medical unit was found expedient. The greatest difficulty of airplane transportation is that the ambulance plane requires suitable landing and takeoff fields and is dependent on land means of transportation. At the flying fields much time was wasted with waiting and loading after the plane had landed. Such delays are avoidable if the probable time of landing is reported in advance to those at the front. For carrying communications in the area between the rear of the front section and temporary air stations for large planes, a small scout plane would be most adequate. Such a plane could restore broken connections in the shortest time, receive new orders, pick out the most suitable open fields in the closest proximity to the wounded and in cases of emergency, if the plane is adapted to it, could pick up one or two severely wounded. The author asserts that not a single wounded man transported by himself in a reclining position has ever suffered airsickness, notwithstanding squalls during several flights. The reason for this lies mainly in the fact of the reclining position of the body, the short duration of the trip and

the avoidance of marked turbulent air currents in the proximity of the ground up to 400 meters. Wounded soldiers have felt very grateful for the airplane transportation. Many soldiers looked on transport of 400 kilometers, to their home base in two hours, as incredible. Great elation was felt over this type of care of the wounded and even among those left behind it created the feeling that everything possible was being done even for the common soldier. The morale of the soldiers is thereby maintained.

Minnesota Medicine, St. Paul

23:533-608 (Aug.) 1940

Present Trends in Study of Arthritis and Rheumatism. R. L. Cecil, New York.—p. 533.
Clinical Aspects of Vitamin B Deficiencies. N. Jolliffe, New York.—p. 542.
Recent Advances in Treatment of Hepatic Disease. A. M. Snell, Rochester.—p. 551.
Preliminary Survey of Anopheline Mosquito Fauna of Southeastern Minnesota and Adjacent Wisconsin Areas. R. H. Daggy, O. J. Muegge and W. A. Riley, St. Paul.—p. 556.
Schizophrenia in Childhood. R. C. Gray, Minneapolis.—p. 565.
Erythroblastosis (Icterus Gravis) in Newborn: Report of Family of Three Children. J. M. Adams and R. F. Cochrane, Minneapolis.—p. 569.
Sulfamido Compounds: Their Practical Applications in Clinical Medicine. A. E. Brown, Rochester.—p. 572.

Nebraska State Medical Journal, Lincoln

25:285-320 (Aug.) 1940

The Person Who Is Sick. H. D. Singer, Chicago.—p. 285.
Prevention of Contagious Diseases in Children. F. Clarke, Omaha.—p. 290.
Injection of Gonadotropic Hormone in Treatment of Undescended Testes. G. W. Ainlay, Fairbury.—p. 292.
Complications of Shoulder Injuries and Their Treatment. H. F. Johnson, Omaha.—p. 295.
Highly Malignant Tumors of Nasopharynx. S. Z. Faier, Omaha.—p. 297.
Management of Acute Infections of Hand. J. E. Courtney, Omaha.—p. 299.
Diagnosis and Treatment of Anemias. J. C. Sharpe, J. S. Latta, G. E. Robertson, L. S. McGoogan, A. S. Rubnitz and W. Thompson, Omaha.—p. 302.

New England Journal of Medicine, Boston

223:165-204 (Aug. 1) 1940

*Renal Factor in Continued Arterial Hypertension not Due to Glomerulonephritis, as Revealed by Intravenous Pyelography: Study of 212 Cases, with Report of Results of Nephrectomy in Nine Cases. R. S. Palmer, R. Chute, N. L. Crone and B. Castleman, Boston.—p. 165.
Neurogenic Dysfunction of Bladder Due to Spinal Anesthesia. E. L. Peirson, Salem, Mass., and C. F. Twomey, Lynn, Mass.—p. 171.
Recurrent Gallstone Ileus: Report of Case. P. R. Hinchey, Salem, Mass.—p. 174.
Athletic and Related Injuries. A. Thorndike Jr., Boston.—p. 180.

Renal Factor in Continued Arterial Hypertension.—According to Palmer and his associates, removal of the affected kidney of a number of patients with unilateral renal disease associated with hypertension has had a marked and beneficial effect on the blood pressure. During the last four years the authors included genito-urinary studies in the survey of their cases of essential hypertension, but they confined this study mostly to patients under 50 and they included at least one intravenous pyelogram in all new cases. Of 596 patients diagnosed as having essential hypertension, intravenous pyelograms were taken in 212. Forty-seven (22 per cent) of 212 patients with continued arterial hypertension not due to glomerulonephritis showed congenital or acquired deformities of the pelves or ureters by urography. The deformity in the pyelogram was unilateral in thirty-four (72 per cent) of these forty-seven cases, or 16 per cent of the 212 cases studied. Such deformities are often incidental but, if significant in the etiology of the hypertension, probably represent a participating or precipitating, rather than a major, factor. Various urologic lesions are observed over long periods without the development of hypertension. Continued arterial hypertension is a fairly common occurrence and the coincidental presence of a certain number of the commoner urologic lesions is likely. The comparative incidence of hypertension and urologic lesions should be studied in the general population. Weiss and Parker believe that chronic infection affects the arterioles in some way so as to bring about a hyperplastic intimal change, which in turn causes ischemia and hypertension. This intimal hyperplastic change, according to Weiss and Parker, after leading to luminal narrowing or even obliteration, is the sine qua non of hypertension in cases of pyelonephritis. When these criteria are applied to the cases discussed in this paper, only two show changes consistent with true hypertensive pyelonephritis. They both showed marked arteriolar hyperplastic changes, lymphocytic infiltration and colloid casts in the tubules. The fact that one of these two cases has been much improved by nephrectomy suggests that the arteriolar hyperplastic change assumes a dominant role in the production of hypertension. That the other case did not respond may possibly be explained by Weiss and Parker's theory that the nephrectomy had been done after the vicious circle—pyelonephritis leading to hypertension, which in turn leads to vascular nephritis in the other kidney—had been established. In considering nephrectomy, the age of the patient and the duration of the hypertension should be considered. In general, it may be said that one should not advise nephrectomy for a unilateral renal lesion when associated with hypertension in women over 45 or men over 50. The factor of congenital predisposition should not be overlooked among patients with continued arterial hypertension. Patients with chronic pyelonephritis, both active and inactive, and those with lesions obstructing the urinary outflow have been followed for many years without the appearance of continued arterial hypertension. The difference between these patients and those with similar urologic lesions and also continued arterial hypertension may lie in the degree of congenital predisposition. The decision to remove the affected kidney, with the hope of curing or modifying the course of the hypertension, is based on three assumptions: that the lesion is not incidental, that there is no vascular disease in the remaining kidney and that there will not be recurrent pyelitis in the remaining kidney.

New Jersey Medical Society Journal, Trenton

37:395-436 (Aug.) 1940

Pyelitis of Pregnancy. V. P. Butler, Jersey City.—p. 399.
Spirometry as Procedure of Determining Pulmonary Efficiency in Pulmonary and Heart Disease: Failure of X-Rays of Chest in Estimating Pulmonary Reserve. G. G. Ornstein and I. G. Epstein, New York.—p. 401.
How the New Food, Drug and Cosmetic Acts Affect Physicians. C. I. Ulmer, Gibbstown, and R. P. Fischelis, Trenton.—p. 411.
New Jersey Maternal Mortality Statistics 1939. A. W. Bingham, East Orange.—p. 415.

New Orleans Medical and Surgical Journal

93:61-110 (Aug.) 1940

Rudolph Matas: Dean of American Surgery. E. C. Cutler, Boston.—p. 61.
Medical Societies of Louisiana Prior to the War Between the States. W. D. Postell, New Orleans.—p. 65.
Samuel A. Cartwright and States' Rights Medicine. Mary Louise Marshall, New Orleans.—p. 74.
Acute Aseptic Meningitis: Discussion of Etiology, Epidemiology and Diagnosis. J. G. Pasternack, New Orleans.—p. 78.
Sulfapyridine Therapy in Pneumococcic Meningitis Complicated by Pulmonary Tuberculosis with Recovery: Case Report. Suzanne Schaefer, New Orleans.—p. 83.
Acute Appendicitis in the Female. L. A. Ledoux, New Orleans.—p. 86.
Early Diagnosis and Treatment of Amebic Abscess of Liver. D. N. Silverman and R. J. St. Martin, New Orleans.—p. 90.
Management of Chronic Suppurative Otitis Media. J. R. Phillips, Baton Rouge.—p. 93.
Syphilis Control in Louisiana. F. S. Williams, New Orleans.—p. 95.

New York State Journal of Medicine, New York

40:1131-1204 (Aug. 1) 1940

Two Milk-Borne Epidemics Traceable to a Single Dairy: Bacillary Dysentery Outbreak. H. S. Ingraham, Kingston.—p. 1135.
Importance of New X-Ray Effect for Daily Diagnostic and Therapeutic X-Ray Work. S. W. Westing, Brooklyn.—p. 1139.
Technic of Modern External Fronto-Ethmosphenoid Sinus Operation. W. Morrison, New York.—p. 1145.
Pulmonary Tuberculosis: Factors Having Bearing on Its Spread in New York City. H. Beeuwkes and R. G. Hahn, New York.—p. 1155.
The Art of Lip Reading: Its Role in Problems of the Hard of Hearing. S. Zwerling, Brooklyn.—p. 1164.
Differential Diagnosis of Mediastinal Tumor and Aortic Aneurysm: Value of Contrast Cardiovascular Visualization. I. Steinberg, G. P. Robb and Ursula J. Roche, New York.—p. 1168.
Treatment of Menopausal Hyperthyroidism with Estrogenic Substance. S. F. Goldman, A. Goldman and R. Kurzrok, New York.—p. 1178.
Clinical Experiences with Gold Salts in Treatment of Rheumatoid Arthritis. J. M. Tarsy, Brooklyn.—p. 1185.
Colitis Following Injection of Gold Salts. L. C. Kelly, New York.—p. 1192.

Psychoanalytic Quarterly, Albany, N. Y.

9:321-452 (July) 1940. **Partial Index**

Libido and Reality in Masochism. B. Berliner, San Francisco.—p. 322.
Introjection, Projection and Identification. R. P. Knight, Topeka, Kan.—p. 334.
Analytic Study of a Cure at Lourdes. S. Blanton, New York.—p. 348.
Dynamics of Dissolution of Transference Resistance. R. Sterba, Detroit.—p. 363.
Structure of the Ego. I. H. Coriat, Boston.—p. 380.
Instinct Dualism in Dreams. L. Jekels and E. Bergler, New York.—p. 394.

Review of Gastroenterology, New York

7:305-372 (July-Aug.) 1940

*Etiologic Indications of Early Gastric Cancer. J. Ewing, New York.—p. 305.
Significance of Meckel's Diverticulum in Surgical Abdomen. G. A. Stewart, Baltimore.—p. 310.
Gastroscopic Study of Treatment of Atrophic Gastritis. L. L. Bower, Philadelphia.—p. 313.
Chronic Gastritis: Its Treatment. R. Upham and H. Barowsky, New York.—p. 314.
Diverticulosis and Diverticulitis of Colon, with Particular Reference to Patients Under 40. C. Bearse, Boston.—p. 318.
Ileocecal Spasm: Cause of Appendicular Syndrome. B. M. Bernstein, Brooklyn.—p. 321.
Diet as a Prescription in Treating Disease. M. Ant, Brooklyn.—p. 325.
Study of Action of Various Neutralizing Agents on Gastric Acidity: Preliminary Report. C. W. Duden and O. Abel Jr., St. Louis.—p. 334.
Rheumatic Intestinal Necrosis. J. Felsen, New York.—p. 339.
New Concept in Treatment of Pruritus Ani and Description of New Needle. A. Schimberg and R. P. Sinaiko, Chicago.—p. 344.
Treatment of Pneumonia Type No. 1 and Chronic Duodenal Ulcer with Sulfapyridine. T. S. Heineken, Bloomfield, N. J.—p. 346.
Sulfanilamide Therapy in Typhoid Fever. E. S. Goodyear, Kingston, N. Y.—p. 348.
Comparison of Newer Liver Function Tests. R. Finkelstein, E. W. Lipschutz and J. M. Hill, Brooklyn.—p. 351.

Etiologic Indications of Early Gastric Cancer.—Ewing discusses gastric cancer from the morphogenic point of view. He admits that this is medical speculation but hopes that it may suggest something of the etiology of early gastric cancer. Certain constitutional factors which may influence its incidence, such as heredity, must be eliminated. Early gastric cancers appear in several varied forms which suggest entirely different modes of origin and exciting agents. Therefore any attempt to simplify their causation is likely to fail. 1. Congenital abnormalities (misplaced portions of gastric or intestinal mucosa and tissue rests of the pancreas and adrenal) give rise to a small proportion of gastric cancers. For the development of these cancers it seems unnecessary to introduce other factors than those inherent in the growth potentialities of misplaced and embryonal cells. 2. A number of gastric cancers develop on polypoid adenomas. The etiologic problem is identical with that of gastrointestinal polyposis. Here a notable hereditary element, in addition to a special susceptibility of the mucosa to react to chemical irritation or infection by atypical changes in the superficial cells and polypoid outgrowths, exists. This group of cases invites investigation of the chemical and bacterial character of the gastric contents. 3. Another group of gastric cancer is combined with pernicious anemia. Usually a small tumor arises in an atrophic mucosa and an atrophic stomach, and both are the results of the atrophic gastritis. The ultimate etiology must be traced back to the causes of atrophic gastritis. 4. The relations between ulcer and cancer of the stomach are rather close, quite obscure and as yet unexplained. These cases present multiple lesions, usually in association with hypertrophic gastritis and sometimes with an atrophic mucosa. Excavation of a gastric adenocarcinoma, giving rise to ulcer and cancer in the same stomach, has been demonstrated. Under these conditions the appearance of precancerous changes on the edges of the ulcer can be accounted for, but these precancerous or preulcerous lesions would not be the result of the ulcer but the cause of the ulcer. Such lesions, if they escaped ulceration, owing to low digestive activity, would go on to fully developed cancer, whereas, if digestive activity were high, ulceration would supervene and the lesion would become a peptic ulcer. Gastric ulcers do not all arise in this manner, but it seems probable that some do, explaining some of the peculiar combinations and assumed transformations between ulcer and cancer in hypertrophic gastritis. An active cancerigenic agent is suggested in such cases. A possible relation to avitaminosis should be considered and the gastric mucosa in cases of the Plummer-Vinson syndrome should be studied. 5. Pyogenic infection cannot stand as a specific cancerigenic agent but it does figure in the appearance of carcinoma in chronically infected wounds. While bacterial infection may probably not be included among the direct exciting causes of gastric cancer, it should not be neglected as a contributing cause which affects its course. 6. The gastric cancer which arises exclusively from the chief cells lining the fundi of the glands while the duct cells remain intact produces most of the cellular small cell diffusely growing and highly malignant gastric carcinomas. Some functional stimulus affecting the functioning cells of the glands seems to be a reasonable hypothesis. The great frequency of gastric cancer is not surprising. The organ is exposed to the mechanical burden of excessive quantities of food and drink, to wide variations of heat and cold, to a multitude of chemical irritants in the ingestants, to insults from powerful medicaments, to a multitude of pathogenic and saprophytic bacteria and to regurgitation of foreign digestants in bile and pancreatic fluids, and at the same time it is required to maintain nearly constant functional activity.

Southern Medical Journal, Birmingham, Ala.

33:783-910 (Aug.) 1940. **Partial Index**

Chronic Back Pain with Sciatica. L. Thornton and C. Sandison, Atlanta, Ga.—p. 783.
Primary Jejunal Ulcer. F. E. Zemp, Columbia, S. C.—p. 803.
Dermatomyositis in Children: Report of Two Cases with Fatal Termination. O. G. Hazel and W. M. Hull, Oklahoma City.—p. 809.
Choice of Hormone Treatment in Male Subgenital Development. D. L. Sexton, St. Louis.—p. 823.
Treatment of Functional Disorders of Female by Radiation of Pituitary Gland. J. Kotz and Elizabeth Parker, Washington, D. C.—p. 832.
Pelvicephalography: Analysis of 503 Selected Cases. W. F. Guerriero, R. E. Arnell and J. B. Irwin, New Orleans.—p. 840.
Tumors Complicating Pregnancy. R. A. Johnston and G. F. Adam, Houston, Texas.—p. 845.
Peptic Ulcer: Résumé of Observation and Study. L. Martin, Baltimore.—p. 851.
Physiologic Factors Affecting Blood Pressure. H. M. Doles, Norfolk, Va.—p. 858.
Humoral Antibody and Tissue Tolerance Induced in Pollen Sensitive Individuals by Specific Therapy: Preliminary Report. Mary Hewitt Loveless, New York.—p. 869.
Review of Recent Research on Drug Prophylaxis and Treatment of Malaria: Report to the National Malaria Committee. H. C. Clark, Panama, Republic of Panama.—p. 879.
Recent Advances in Epidemiology of Malaria. J. Andrews, Atlanta, Ga.; E. C. Faust, New Orleans, and R. B. Watson, Wilson Dam, Ala.—p. 883.
Malaria Control Activities: Report of Subcommittee on Malaria Prevention Activities, 1939, to National Malaria Committee. L. L. Williams Jr., Washington, D. C.—p. 894.
Malaria Mortality in Southern United States for the Year 1938. E. C. Faust and Virginia Parker, New Orleans.—p. 897.
Engineering Phases of Malaria Control. L. M. Clarkson, Atlanta, Ga.—p. 900.

Southern Surgeon, Atlanta, Ga.

9:539-616 (Aug.) 1940

Indications for Surgical Treatment of Intracranial Tumor. P. Bailey, Chicago.—p. 539.
Surgical Problems Presented by Jaundice in Infancy and Childhood. S. J. Seeger, Milwaukee.—p. 552.
Nailing of Fractured Neck of Femur Without X-Ray. W. Zuelzer, Dallas, Texas.—p. 566.
Classification and Treatment of Chronic Arthritis. K. K. Sherwood, Seattle.—p. 571.
Amebiasis: Cause of Abdominal Pain. F. M. Massie, Lexington, Ky.—p. 584.
Gastrojejunal Ulceration. J. W. Gibbon, Charlotte, N. C.—p. 593.
Progress and Development in Surgical Treatment of Pulmonary Tuberculosis. F. S. Johns, Richmond, Va.—p. 607.

Southwestern Medicine, El Paso, Texas

24:221-252 (July) 1940

Protection of Circulation in Surgery. W. S. Middleton, Madison, Wis.—p. 221.
Eye Conditions of Interest to the General Physician. O. B. Nugent, Chicago.—p. 223.
Refraction and Muscle Balance in Aviation. M. P. S. Spearman, El Paso, Texas.—p. 228.
Pathology of Lymphoblastoma. J. W. Budd, Los Angeles.—p. 230.
Epidemic Encephalitis: Report of Sporadic Case. S. J. Grauman, Tucson, Ariz.—p. 232.
Significance of Convulsions. S. D. Ingham, Los Angeles.—p. 234.

Surgery, Gynecology and Obstetrics, Chicago

71:129-208 (Aug.) 1940

*Gastroscopic Observations in Cases of Gastric Distress Following Operations on Stomach. H. J. Moersch and W. Walters, Rochester, Minn. —p. 129.
*Carcinoma of Stomach: Review of 444 Cases to Emphasize Inadequacy of Present Methods for Early Diagnosis. R. H. Abrahamson and J. W. Hinton, New York.—p. 135.
Dangers of Indiscriminate Coverance of Parenterally Administered Glucose with Insulin. P. C. Eschweiler, Brooklyn.—p. 141.
Renal Displacement. M. Muschat and L. Edeiken, Philadelphia.—p. 146.
*Experimental Study of Surgical Treatment of Coronary Disease. M. Fauteux, Montreal.—p. 151.
Carbohydrate Metabolism in Thyrotoxicosis: I. Experimental Study. E. E. Blanck, Chicago.—p. 156.
Observations on Roentgenologic Evidence of Fetal Death. H. Thoms, New Haven, Conn.—p. 169.
Influence of Hot and Cold Application on Gastric and Intestinal Motor Activity. J. D. Bisgard and D. Nye, Omaha.—p. 172.
Cancer and Its Relations to Pregnancy and Delivery, to Marital and Social Status: II. Cancer of Organs Other Than Reproductive; Total Cancer Mortality. S. Peller, Baltimore.—p. 181.
Rhinoplasty: Argentine Method. O. Ivanissevich and R. C. Ferrari, Buenos Aires, Argentina.—p. 187.
Opening of Anterior Tracheal Wall in Tracheotomy. R. Waldapfel, Grand Junction, Colo.—p. 191.
Bilateral Intercostal Nerve Block for Upper Abdominal Surgery. R. W. Bartlett, St. Louis.—p. 194.
Slipping of Upper Femoral Epiphysis. H. Waldenström, Stockholm, Sweden.—p. 198.
Treatment of Adynamic Ileus by Gastrointestinal Intubation in Children. G. C. Penberthy, R. J. Noer and C. D. Benson, Detroit.—p. 211.
Supernumerary Tarsal Scaphoids. E. K. Cravener and D. G. MacElroy, Schenectady, N. Y.—p. 218.
Surgical Treatment of Hyperostosing Meningiomas of Sphenoid Wing. J. L. Poppen and G. Horrax, Boston.—p. 222.
Causes of Death in Cancer of Cervix Uteri. L. S. Auster and A. M. Sala, New York.—p. 231.
Primary Partial Gastrectomy (Pólya Type) for Duodenal Ulcer: Study of Results in 212 Cases. W. Walters, E. B. Lewis and R. G. Lemon, Rochester, Minn.—p. 240.

Gastroscopic Observations After Operation.—Moersch and Walters review gastroscopic observations on 100 patients who had undergone operations on the stomach and who subsequently developed gastric distress. They concluded that gastroscopy can be of assistance in reaching a better understanding of the factors leading to gastric distress after operations on the stomach. Contrary to the commonly accepted teaching that gastritis is found in all stomachs after operation, in 30 per cent of these cases of persistent dyspepsia gastroscopic evidence of disease was not present. As a rule, in the cases in which abnormality of the gastric mucosa was not demonstrated by gastroscopy the functional factor was found to be rather pronounced, and most patients responded symptomatically to therapeutic measures directed to this end. The diagnosis of gastritis was made on gastroscopic observations in fifty-six cases. In contrast to the cases in which gastroscopy revealed normal gastric mucosa the response to medical management was not as satisfactory, and further operation was frequently required. Postoperative gastritis may be thought to be a manifestation of gastritis that existed before operation. This is often true, and many postoperative complications might be avoided if this possibility was always recognized before operation. On the other hand, it is known that gastritis does develop after operation and also that gastritis which is present before operation may disappear after operation. That gastritis undoubtedly does develop after operation is seen from the fact that evidence of gastritis was present in 56 per cent of the cases in this study. In comparison, Swalm, Jackson and Morrison found gastritis in only 35 per cent of their routine gastroscopic examinations, and Schindler reported an incidence of 41.8 per cent. Speculating about the possible factors responsible for postoperative gastritis, the authors suggest that no doubt in many cases a preexisting gastritis is the responsible factor. In their opinion a poorly placed stoma with inadequate drainage of the stomach is an important factor. Gastritis is not as likely to develop if the stoma retains an activity resembling that of a sphincter. Infection constitutes an important exciting factor. Other lesions, such as gastrojejunal ulcer, carcinoma, gastric ulcer and benign tumor, can and do develop in the stomach after operation, and gastroscopy may be of assistance in their recognition. In five cases in this series carcinoma of the stomach was found on gastroscopic examination and in six cases gastrojejunal ulcer was visualized.

Inadequacy of Methods for Early Diagnosis of Gastric Carcinoma.—Abrahamson and Hinton state that during the last two decades—1919 to 1938 inclusive—444 patients with cancer of the stomach were admitted to the Fourth Division of Bellevue Hospital. Of these 296, or two thirds, were inoperable on admission. After clinical and x-ray examination 148, or one third, were considered operable. However, even in this group exploratory laparotomy proved in sixty-nine cases that no operative measure could be undertaken. In only twenty-four cases, or 5.4 per cent of the total and 16.2 per cent of the 148 operable cases, could gastric resection be done, the only method providing hope for affecting a permanent cure in gastric carcinoma. Thus the outlook is at present a dismal one, since the largest number of cases in which the diagnosis is made are already in an inoperable stage. Often when operability still exists, resectability is impossible. The most dependable confirmations of diagnosis are the x-rays, the gastroscope and the gastric test meal. The latter is the simplest and may be repeated at frequent intervals at relatively little expense. When examination shows a declining gastric acidity, the suspicion of carcinoma must be entertained and disproved. X-ray studies of the stomach should be made with greater frequency in suggestive cases and in those with undiagnosed and vague manifestations. X-ray examination of these patients is necessary, not to verify an already made clinical diagnosis, but for careful search where there is no evidence or only minimal evidence of gastric disturbance. The technic of gastric resection has been perfected and further operative refinements cannot offer hope for lengthening the life span of patients with gastric carcinoma. Their hope resides in the development of a means of diagnosis which will permit surgical intervention when the lesion is pathologically young rather than early in the clinical course. Until more specific tests are developed, each patient should have the benefit of such methods as are at our disposal. Faithful use of the test meal, the x-rays and the gastroscope may help to disclose early carcinomatous lesions. The knowledge of the present dark outlook for the patient with carcinoma of the stomach should be disseminated among all practitioners and students of medicine.

Surgical Treatment of Coronary Disease.—It has been suggested that the similarity of arteriosclerotic disease of the coronary arteries and of the extremities should permit of the application in the heart of surgical methods found useful in the treatment of peripheral vascular disease. Fauteux describes experiments on dogs undertaken to observe the effect of a partial coronary arteriectomy of the ramus descendens and a partial coronary arteriectomy of the same arterial trunk combined with ligation of the vena magna cordis. A high mortality resulted when partial resection of the ramus descendens at a high level was done. When the same procedure was carried out after venous ligation, all dogs, apart from those dying of operative complications and intercurrent disease, remained healthy for over a year. The author concluded that vena magna cordis ligation in occlusion of the left ramus descendens helps to maintain adequate coronary circulation after partial coronary arteriectomy. The results of these experiments suggest that in properly selected cases coronary vein ligation may be expected to act as a preventive measure against a second attack of coronary thrombosis and also to improve the coronary circulation sufficiently to relieve the pain of "angina of effort." It seems a logical procedure in traumatic surgery of the heart whenever it is necessary to ligate an important coronary arterial branch that is bleeding.

Wisconsin Medical Journal, Madison

39:581-700 (Aug.) 1940

Recognition and Management of Gastrointestinal Allergy. T. L. Squier, Milwaukee.—p. 595.
Experience with Immunization Procedures in Home and Office Practice. F. R. Janney, Wauwatosa.—p. 599.
Pediatric-Urologic Problem: Congenital Valves of Posterior Urethra with Case Report. W. M. Kearns and E. B. Jacobson, Milwaukee.—p. 603.
Fat-Carbohydrate Ratios of Diet and Insulin Requirements in Diabetes Mellitus. R. S. Baldwin, Marshfield.—p. 606.
Retroposition of Uterus: Evaluation of Its Effect on Certain Phases and Events of a Woman's Life. C. S. Harper, Madison.—p. 610.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

2:73-106 (July 20) 1940

*Preserved Blood, Analysis of Its Use: Report from Merseyside War Blood Bank. F. R. Edwards and T. B. Davie.—p. 73.
Medical Treatment of Peptic Ulcer. E. Spriggs.—p. 78.
Effects of Supplement of Vitamin B (Adsorbate) on Growth of Infants. Margaret R. Price.—p. 80.
Postoperative Pulmonary Complications. B. N. Sircar and F. K. Boston. —p. 82.
Congenital Atresia of Esophagus. Mildred I. Ealing.—p. 83.

Preserved Blood.—On the basis of 1,364 bottles of stored blood, Edwards and Davie sought to determine the therapeutic value of stored blood as compared with that of fresh blood, and the extent to which its availability, standardization of technic and convenience of administration outweighed possible disadvantages. A number of hospitals cooperated in the investigation. Banked blood used by them was preserved in a 3.8 per cent solution of sodium citrate, the unit consisting of 450 cc., of which 45 cc. represented the anticoagulant solution. An apparatus of recent manufacture, supplied with an internal filter of glass shot that prevents clogging of needles and filters and allows storage bottles to remain closed at all times, was used. The blood withdrawing and delivery apparatus together with the "veinseeker" in cases of collapsed veins are illustrated. Wastage of bank blood, about 9 per cent in 1,500 bottles, was due to hemolysis or to accidents, such as overheating of blood and failure to return unused blood immediately to the refrigerator. The investigators noted in comparative transfusions with both fresh citrated and preserved blood that reactions due to the administration of banked blood were probably no greater than those due to fresh blood. Of 1,364 bottles of banked blood sixty-nine (5 per cent) gave rise to grade 3 reaction (definite rigor) with cases of acute posthemorrhagic anemia, chronic secondary anemia and acute septic conditions leading. However, no serious or permanent ill effects were observed. No case of transmitted disease occurred and no definitely infected bottle was found. Five deaths occurred during transfusion of patients who were moribund before transfusion. Of seventy-one patients who died soon after the transfusions only one showed rigor, a child with streptococcic septicemia. In many of these cases, transfusion apparently was a counsel of desperation, for the majority suffered from some disease of severe character. Of all transfusions, 87.5 per cent were considered to be of benefit to the patients. As a life saving measure in cases of acute hemorrhage with or without shock, preserved blood was as efficacious as fresh blood. Of 509 transfusions given for acute hemorrhage, 463 (91 per cent) were considered to be satisfactory. Likewise, in 316 transfusions given for chronic secondary anemia 292 (92 per cent) were regarded in the same way. The authors believe that in the presence of these diseases the ready availability of stored blood in bulk marks a true advance over the individual donor system. For certain other diseases of the hemopoietic system and for cases of anemia associated with sepsis, they regard fresh blood as preferable. They emphasize the importance of absolute correct grouping, the complete cleanliness of all apparatus and the elimination of all pyrogenic factors in the diluent solution. Since grade 3 reactions were undoubtedly increased by the age of the blood, they advise against the use of blood older than ten days.

2:107-142 (July 27) 1940

*Thoracoscopy of Extrapleural Pneumothorax. R. J. C. Maxwell.—p. 107.
Asthma in Childhood: Discussion of Psychologic Aspect. Muriel Barton Hall.—p. 110.
Treatment of Inguinal Hernia in Adults. J. F. O'Connor.—p. 113.
Scarlet Fever in a Public School. J. K. Bostock.—p. 115.
Use of Plasma or Serum as Substitute for Whole Blood. C. H. Best and D. Y. Solandt.—p. 116.

Thoracoscopy of Extrapleural Pneumothorax.—Maxwell states that, although the walls of an extrapleural pneumothorax may be dry at the completion of pneumolysis, a greater or lesser amount of oozing invariably occurs afterward. Schmidt found in a review of 200 cases that in a large proportion the pneumothorax space showed subsequently a tendency to obliterate. Roberts expressed the opinion that obliteration is less likely to take place if the blood clot is broken up and aspirated. This is done under thoracoscopic control. The author treated three cases in this way and examined a fourth with the thoracoscope two months after pneumolysis. He describes the endoscopic appearance of the extrapleural pneumothorax in which postoperative hemorrhage occurred. In the extrapleural pneumothoraces in which endoscopy was employed soon after pneumolysis, long stalactites of blood clot with their apexes free and pendulating, or cones already attached to the lung, were seen, either at the first survey or after the softer clot that covered them had been removed. The longer stalactites of fibrin have always been found arising from the anterior chest wall. None of them were attached to the lung. The posterior projections were broader and shorter, cone shaped or sugar-loaf shaped, and in both cases fixed to the posterior surface of the lung. The semiupright position in which patients are nursed and the tendency of the collapsed lung to fall back toward the paravertebral gutter explain the greater length of the anterior stalactites and the apparent paradox that the shorter posterior cones seem more frequently to adhere to the lung. The author points out that thoracoscopy has revealed that obliterative pleurisy in intrapleural pneumothorax is often a sequel to the organization and contraction of interpleural fibrin bands. A similar mechanism is probably at work in the obliterating extrapleural pneumothorax. The fibrin bands are the cones or stalactites.

Edinburgh Medical Journal

47:513-584 (Aug.) 1940

Debatable Tumors in Human and Animal Pathology: IX. Endothelioma. W. F. Harvey, E. K. Dawson and J. R. M. Innes.—p. 513.
Survey of Biologic Types of Diphtheria Bacillus in Edinburgh, 1932-1939. Helen A. Wright.—p. 541.
Studies on Stored Blood: II. Leukocytes in Stored Blood. A. Crosbie and H. Scarborough.—p. 553.
Id.: III. Oxygen Capacity of Stored Blood. H. Scarborough and J. C. Thompson.—p. 567.
Id.: IV. Modifications in Equipment for Blood Transfusion. C. P. Stewart.—p. 571.

Journal of Hygiene, London

40:377-500 (July) 1940

Reversed Passive Anaphylaxis in Guinea Pig. M. van den Ende.—p. 377.
*Nonpulmonary Tuberculosis Caused by Bovine Type of Tubercle Bacillus in Children in Eire. C. Mushatt.—p. 396.
Distribution and Significance of Typhoid Vi Agglutinins in Normal Serums of African Natives. L. J. Davis.—p. 406.
Simple Modification of Wilson and Blair's Medium for Isolation of Typhoid and Paratyphoid Bacilli (Brilliant Green, Bismuth-Ammonium-Citrate and Sodium Sulfite Medium—B. B. S. Medium). S. Tyagaraja. —p. 414.
Comparison of Specific Mortality Rates in Town and Country Districts of Scotland Since 1871. R. S. Barclay, W. O. Kermack and A. G. McKendrick.—p. 423.
Reduction of Carcinogenic and Dermatitic Activity of Shale Oil Recovered from Peritoneal Cavities of Injected Mice. J. M. Twort and R. Lyth. —p. 434.
Diet of Group of Durham Miners Free from Nystagmus. C. E. Kellett. —p. 439.
Human Foot Perspiration and Upper Leather. A. Colin-Russ.—p. 447.
Porosity of, and Bacterial Invasion Through, Shell of Hen's Egg. R. B. Haines and T. Moran.—p. 453.
Some Experiments with Certain Liquid Insecticides in Houses Infested with the Bedbug, Cimex Lectularius L. A. J. Musgrave.—p. 462.
Experimental Investigation on Action of Coramin. G. N. Myers.—p. 474.

Nonpulmonary Tuberculosis Caused by Bovine Tubercle Bacillus.—Mushatt isolated strains of tubercle bacilli from fifty hospitalized children up to 14 years of age with nonpulmonary tuberculosis: cervical adenitis, bone and joint disease, meningitis and primary abdominal tuberculosis. Most of the patients were members of working class families. Thirty-seven of the strains of tubercle bacilli were of the human type and seventeen of the bovine type. The gland and joint cases were largely abscesses from which pus was aspirated. Of the fourteen cases of cervical adenitis ten were caused by strains of the bovine type, and four of the twenty-two cases of bone and joint disease and three of twelve cases of meningitis were caused by bovine strains. Material from two cases of primary abdominal tuberculosis yielded human strains.

Journal of Pathology and Bacteriology, Edinburgh

51:1-168 (July) 1940

Nature of Fatty Change in Kidneys. J. H. Dible and J. D. Hay.—p. 1.
Effects of Prolonged Estrogen Administration on Male Mice of Various Strains: Development of Testicular Tumors in Strong A Strain. Georgiana M. Bonser and J. M. Robson.—p. 9.
Structure of Blood Vessels in Cerebral Tumors. J. Gough.—p. 23.
Inhibitory Action of Potassium Tellurite on Coliform Bacteria. A. Fleming and M. Y. Young.—p. 29.
Cholesterol Pleural Effusion. H. H. Moll and F. S. Fowweather.—p. 37.
Lesions in Mouse Produced by Streptolysins O and S. W. G. Barnard and E. W. Todd.—p. 43.
Production of Pertussis Antitoxin in Rabbits and Neutralization of Pertussis, Parapertussis and Bronchiseptica Toxins. D. G. Evans.—p. 49.
Relationship of Oxidation-Reduction Potentials Developed in Bacterial Cultures to Production of Hydrogen Peroxide. K. I. Johnstone.—p. 59.
Changes in Adrenals of Gonadectomized Male and Female Rats Produced by Prolonged Injections of Sex Hormones. Kathleen Hall.—p. 75.
Pathway of Pituitary Colloid Through Hypothalamus. G. Popják.—p. 83.
Action of 2-*p*-Aminobenzenesulfonamido-4-Methylthiazole in Experimental Pneumococcic Infections. G. Ivánovics.—p. 91.
Capsule of Plague Bacillus. S. S. Sokhey.—p. 97.
Mode of Action of Sulfanilamide. A. T. Fuller, L. Colebrook and W. R. Maxted.—p. 105.
Comparative Susceptibility of Chick Embryo and Chick to Infection with Borrelia Duttoni. R. K. Oag.—p. 127.

Journal of Physiology, Cambridge

98:263-388 (July) 1940

Effects of Sympathomimetic Amines on Perfused Blood Vessels. M. C. Morton and M. L. Tainter.—p. 263.
Substance Causing Renal Hypertension. E. Braun-Menendez, J. C. Fasciolo, L. F. Leloir and J. M. Muñoz.—p. 283.
Electrolyte Content and Action Potential of Giant Nerve Fibers of Loligo. D. A. Webb and J. Z. Young.—p. 299.
Effect of Renin on Urine Formation. G. W. Pickering and M. Prinzmetal.—p. 314.
Mechanisms of Dilution Diuresis in Isolated Kidney and Anesthetized Dog. M. Grace Eggleton, J. R. Pappenheimer and F. R. Winton.—p. 336.
Inactivation of Adrenalin in Vivo in Man. D. Richter.—p. 361.
Effect of Riboflavin, Riboflavin-Phosphoric Acid and Cortical Hormone on Survival of Adrenalectomized Rats Receiving Normal and Riboflavin-Deficient Diets. H. M. Bruce and R. Wien.—p. 375.

Lancet, London

2:61-90 (July 20) 1940

Mothers Under 16. Letitia Fairfield.—p. 61.
*Penetrating Wounds of Chest: Experience in the Last War. J. A. Ryle.—p. 63.
Intramuscular Administration of Fluids. B. R. Billimoria and E. E. Dunlop.—p. 65.
Capillary Resistance in Toxic Manifestations of Antisyphilitic Therapy. G. Horne and H. Scarborough.—p. 66.
*Alum Precipitated Toxoid in Diphtheria: Duration of Immunity After One-Shot Method. F. C. Faragó.—p. 68.
Treatment of Wound Shock with Corticosterone. H. Selye and C. Dosne.—p. 70.

2:91-122 (July 27) 1940

Facial Paralysis and Its Operative Treatment. Josephine Collier.—p. 91.
Chronic Neurotics and the Outbreak of War. Elizabeth H. Rosenberg and E. Guttmann.—p. 95.
Diphtheritic Myocarditis Complicating Myocardial Degeneration. G. Bourne.—p. 96.
Ether Convulsions: Report of Case. N. R. James and E. A. Pask.—p. 97.
Postoperative Distention of Abdomen: Etiology and Treatment. H. Dodd.—p. 98.
Pfeiffer's Bacillus Meningitis: Two Unusual Cases. J. H. Dowds.—p. 100.
Local Effects of Sulfonamides on Rabbit's Brain. Dorothy S. Russell and M. A. Falconer.—p. 100.
Volvulus of Cecum Associated with Reversed Rotation of Middle Gut. C. C. Holman.—p. 101.
Suprarenal Hemorrhage in Meningococcic Septicemia: Waterhouse-Friderichsen Syndrome. W. H. Grace, C. V. Harrison and T. B. Davie.—p. 102.

Penetrating Wounds of Chest.—Ryle reviews the records of penetrating wounds of the chest admitted under his care during 1917 at a casualty clearing station near Ypres. The patients totaled 130, and thirty (23 per cent) of them died. Since none were discharged to the base until shock, sepsis and hemorrhage were under control and they were judged fit for the long train journey, it is unlikely that there was a high toll of subsequent deaths. In four of the thirty fatal cases there were serious multiple wounds besides the chest wound; seven patients died within twenty-four hours of admission; in one there was perforation of the gullet besides the lung and a tear in the aorta plugged with thrombus, the patient surviving to the third day; in five there was damage to diaphragm and liver or spleen. If a patient is admitted in bad condition not attributable to other wounds, the cause may be one of the three following: 1. A "leaking" or "sucking" hemothorax or pneumothorax, calling for immediate plugging with wet eusol gauze and a firm pad with strapping or a binder. 2. A tension pneumothorax calling for relief with the needle. The author never saw this as a complication of a penetrating wound; it is more likely to follow a crush injury. 3. Penetration of the diaphragm by a fragment passing through the chest and lung with damage to one or more of the abdominal viscera. A "leaking" hemothorax usually shows a large entry or exit wound from which there is a considerable flow or trickle or rhythmic spouting of blood or bloody fluid. An audibly "sucking" or "open" pneumothorax explains itself and calls for similar immediate treatment. The further immediate treatment in all such cases is the usual treatment for shock or hemorrhage. The procedure in closed hemothorax, apart from appropriate nursing, postural measures and relief of dyspnea and pain, was to wait until the second day and then to needle and withdraw a syringeful of blood. This should be examined with the naked eye and the nose. The change from the appearances of normal blood or bloody effusion to the more fluid and purple appearance of laked or hemolyzed blood is soon appreciated. While it remains unlaked and sweet there is no heavy anaerobic infection. In the presence of laking and smell the chest should be drained, and there is no need to await the bacteriologic report. According to the patient's condition and the temperature chart, subsequent needlings for inspection and culture are carried out on the third or fourth and, if necessary, on subsequent days. In patients with the graver "leaking" or "sucking" wounds of the chest who survive the first day or two surgical intervention will nearly always become necessary for purposes of drainage of an infected effusion, toilet of the wounds and comminuted ribs and, when feasible, removal of the foreign body. The time for such action must be determined by the conditions obtaining in each case. The author has no doubt that with earlier admissions and better treatment of hemorrhage and shock early intervention will be undertaken more often than it was in 1917 and that the primary operations with removal of fragments, repair and closure will become more usual and save lives. Such primary operations should never be undertaken unless the patient is likely to remain under close observation.

Alum Precipitated Toxoid in Diphtheria.—Faragó reports experiences with one-shot immunization with alum precipitated toxoid. His investigations were made on 22,000 children in Hungary. He found the Schick test reliable for mass control. The Schick toxin contained a fiftieth of a minimal lethal dose in 0.1 cc. and conformed to the demands set up by the permanent commission of biologic standardization of the League of Nations. The subjects tested were children who had been vaccinated by the one-shot method from one to five years previously and had never received any other diphtheria antigen; they had not even received the Schick test before. The purity of the precipitated and five times washed toxoid is about six times higher than that of the liquid toxoid. It contains about 2 mg. of alum and 47 protective units per cubic centimeter. The precipitate forms about a third of the total volume of the vaccine. The preparation of such a vaccine was justified by the observation that the formation of a depot, slow absorption and a more lasting antigen stimulus is promoted by an increased amount of the precipitate. The reactions produced by the alum precipitated toxoid were not more but rather less than those caused by the old fluid toxoid. The author tabulates separately the results for the age group from 2 to 6 years and from 7 to 11 years. The Schick test on children aged from 2 to 6 years who had received at the age of 2 their only vaccination against diphtheria in the form of 1 cc. of alum precipitated toxoid revealed that the immunity of children below school age is not ideal but, from the practical point of view, sufficient a year after vaccination. Afterward the immunity shows a slight tendency to fall, but the fall never reaches such proportions as to condemn the routine use of the one-shot method. About 80 per cent of the older children were vaccinated with alum

precipitated toxoid at the age of 7, and about 20 per cent from one to two years earlier. Results of Schick tests show that the immunity of this group surpasses that of the younger children. The immunity of children vaccinated at 2 and revaccinated at 7 also was investigated. The results in these may be regarded as the maximum of immunity that can be achieved by immunologic methods. The author concludes that an adequate immunity develops after one injection of alum precipitated toxoid and that this lasts for a sufficiently long period.

South African Medical Journal, Cape Town

14:231-250 (June 22) 1940

Onyalai in Northern Bechuanaland. A. A. Morgan and B. T. Squires.—p. 231.
Occurrence of Bacterium Flexneri Race P. 119 in South Africa. C. de V. Bevan.—p. 234.
Studies on Venom of "Boomslang" (Tree Snake) (Dispholidus Typus). E. Grasset and A. W. Schaafsma.—p. 236.
Observations on Amidopyrine Test for Blood. B. Serebro.—p. 242.
Case of Perforated Tuberculous Pyloric Ulcer and Case of Perforated Duodenal Ulcer in Natives of Southern Rhodesia. M. Gelfand and V. Carlisle.—p. 244.
South African Typhus, with Special Reference to Use of Alum Precipitated Vaccine. M. H. Finlayson.—p. 247.

Schweizerische medizinische Wochenschrift, Basel

70:685-708 (July 20) 1940

Modern Conceptions of Origin and Development of Human Blood Corpuscles. K. Rohr.—p. 685.
Keratoderma Senile Volae Manuum et Plantae Pedum and Its Cure by Perandren (Androgen Substance). C. Henschen.—p. 690.
Carbon Dioxide Respiration as Test for Changed Irritability of Respiratory Center. R. Meier and R. Müller.—p. 694.
Acute Crisis of Thrombopenic Purpura Following Late Vaccinal Generalization. Elisabeth Regamey.—p. 697.
*Artificial Tympanic Membrane in Comparison with Hearing Devices. Nadoleczny-Millioud.—p. 700.
Foot Troubles in Military Service. R. Scherb, M. R. Francillon and E. Burckhardt.—p. 701.

Artificial Tympanic Membrane in Comparison with Hearing Apparatus.—According to Nadoleczny-Millioud the artificial tympanic membrane is used only in defects of the tympanum or after radical operation, when the hardness of hearing is bilateral. It is hardly ever employed as long as one ear still has adequate hearing. It has the disadvantage of making the patient dependent on the otologist, who frequently has to change or readjust the membrane; moreover, he has to make it and fit it, because the tympanic prostheses obtainable on the market are rarely suitable. Occasionally the artificial tympanum irritates and produces secretion, but this is harmless and disappears quickly; the fear of recurrent suppuration is generally exaggerated. It should not prevent a trial with a tympanic prosthesis in cases in which it is indicated; that is, in all dry perforations or scars. It has one disadvantage in common with the hearing apparatus: noises which the patient did not hear before are now excessively loud. Because of this the patient at first may find it difficult to go to sleep. The artificial tympanum has several advantages: It is not visible from the outside, it causes practically no distortion and it does not make the patient more hard of hearing for some sounds than he is. The available electrical hearing devices do not transmit sounds undistorted. Another advantage of the artificial tympanum is the disappearance or the weakening of subjective sounds (tinnitus). There are two methods of estimating the value of a hearing prosthesis: The first is the exact quantitative and qualitative examination of the auditory capacity with and without the prosthesis; the second is the report of patients who have some knowledge of acoustics and of music and who observe themselves carefully. The author describes in detail the experiences of one patient who had undergone a bilateral radical operation and who had used not only several electrical hearing devices but also an artificial tympanum of silver-leaf. The patient asserted that the acoustic effect of the silver-leaf tympanum was comparable, although not quite equal, to that of a rather large and cumbersome (weight 9 Kg.) condenser-microphone, in which the loudness could be modified and which he used when attending meetings and lectures. The subjective effect of the artificial tympanum, however, is even better than that of the apparatus. It overcomes all self consciousness because it makes strings and technical devices unnecessary. The patient has no difficulty in keeping up a conversation in a small group if the tympanum fits well. The ability to hear everyday noises has a beneficial psychologic effect. The superiority of the artificial tympanum over other hearing aids is due chiefly to the faithful transmission of the high tones up to the fifth-marked octave. Artificial tympanums are now being made not only of silver-foil but also of cellophane. The fact that this hearing prosthesis is suitable for only certain patients is, in the belief of the author, no reason for neglecting it completely.

Anais Brasileiros de Ginecologia, Rio de Janeiro

9:483-570 (June) 1940. **Partial Index**

*Vulvovaginal Moniliasis. F. Ruiz Arce.—p. 483.
Intravenous Eunarcon Anesthesia in Minor Gynecologic Surgery. J. Gallucci.—p. 501.

Vulvovaginal Moniliasis.—Ruiz Arce reports ten cases of acute, subacute or chronic vulvovaginal moniliasis in young adult women, with the exception of one who was in the menopause. The patients were in good general, nutritional and hygienic condition. The duration of the infection varied from two months to three years, except one of thirteen years' duration. Three patients in the group had diabetes, three were pregnant, five presented venous engorgement of the pelvis manifested by varices of the saphenous vein and of the small vulval venules, hemorrhoids and engorgement of the local subcutaneous capillaries. A clinical diagnosis was made in the majority of the cases from the symptoms. Acute infection manifested itself by discharge, vulval pruritus intensified at night and before menstruation, pain and burning in the vagina during voiding, increase of local temperature and sometimes leukorrhea. The internal surfaces of the vulva and vagina were red, edematous and spotted with typical mycotic patches abundant at the lower part of the vagina. In some the neck of the uterus was involved. Chronic forms presented a typical appearance of dermatitis suggestive of early kraurosis or atrophic chronic vulvitis. Sometimes the vulva had the aspect of a so-called creamy vulva. The diagnosis was confirmed by smears and cultures from vaginal and vulval secretions. The smears were stained by the Gram method and the cultures grown on the Sabouraud medium. Any attempt to classify Monilia as to definite types is unnecessary for the purpose of a diagnosis. Monilia may be present alone or in association with bacteria. In one case the vaginal secretion contained Monilia and Trichomonas. Satisfactory results were obtained in all cases from daily topical application of a 2 per cent gentian violet solution.

Prensa Médica Argentina, Buenos Aires

27:1475-1522 (July 17) 1940. **Partial Index**

Recurrent Emphysematous Spontaneous Pneumothorax. M. R. Castex, E. S. Mazzei and J. M. Remolar.—p. 1475.
*Tuberculous Cavities of Lung. H. A. Passalacqua and M. O. Dunan.—p. 1491.

Suction Drainage of Tuberculous Cavities of Lung.—Passalacqua and Dunan emphasize the value of Monaldi's suction drainage of tuberculous cavities of the lung. Three cases are reported. The method consists of puncturing the cavity through the thoracic wall with a trocar, introducing a thin rubber catheter, fixing the external segment of the catheter to the thoracic wall and connecting its distal end to a system of continued siphonage. The site of the puncture and direction of the trocar are determined from the position of the cavity as ascertained by x-ray examination. The depth of introduction of the catheter is determined by the number of centimeters the trocar traverses from the thoracic wall to the cavity. The catheter is clamped for the first twenty-four hours if blood does not appear in the secretions removed by a syringe, and for two or three days if there is blood. On the day or days when the catheter is clamped, the clamp it released at intervals of from eight to twelve hours and the secretion is removed by aspiration with a syringe, after which the catheter is connected with the suction system. Continuous aspiration is maintained for the first few weeks, up to the time when the cavity collapses and expansion of tissues about the cavity is demonstrated in roentgenograms. The suction is then discontinued for a few hours a day, during meal time and sleep. Suction

is continued until healing of the cavity takes place. The process of healing of the cavity is paralleled by the improvement in the clinical symptoms and general condition of the patients. Fever and toxic symptoms disappear early in the course of treatment, the amount of sputum and secretion diminish and disappear, the tubercle bacilli disappear from both the secretion and the sputum, and the appetite and general condition of the patients improve. The proper position and functioning of the catheter are verified at intervals. If the catheter becomes obstructed, it is cleared by aspiration but never by insufflation of air. The catheter remains in the cavity for from two to five months. Removal of the catheter is determined by the healing of the cavity as demonstrated in roentgenograms. The channel left by the catheter heals spontaneously without formation of a fistula.

Semana Médica, Buenos Aires

47:225-280 (Aug. 1) 1940. **Partial Index**

Fetal Adenoma of Thyroid in Child: Case. J. L. Monserrat and J. M. Pelliza.—p. 260.
*Acetarsone in Dementia Paralytica. N. G. Blaiotta.—p. 266.

Acetarsone in Dementia Paralytica. — Blaiotta reports fifteen unselected cases of dementia paralytica treated by subcutaneous injections of acetarsone and a bismuth compound. The injection, in a dose of 1 Gm. of acetarsone, was given three times a week in a series of twenty-one injections with intervals of a month and a month and a half, respectively, between the first three series and of two months between further series. Duration of the treatment was determined by the behavior of the cerebrospinal fluid. The latter showed favorable alteration by the end of the first or second series when the results of the treatment were satisfactory, except when paradoxical reactions took place. The bismuth preparation was administered in combination with the arsenical treatment as soon as favorable modification of the cerebrospinal fluid was noted. Twelve of the patients were given the arsenical and bismuth treatment alone, two patients were given the treatment one year after failure of malarial therapy and insufficient arsphenamine treatment, and for one patient, in an advanced stage of the disease, the treatment was changed to malarial therapy, which failed. The dementia forms with agitation or with megalomania were predominant in the group. Only one patient was ambulant. The remaining fourteen were kept in bed early in the course of the treatment. Of the group of patients treated by arsenic and the bismuth compound six had a complete remission, five resumed work and two discontinued treatment in the course of incomplete remissions. One patient exhibited a paradoxical reaction of the cerebrospinal fluid with cyclic delirium. Two patients had a physical and serologic improvement but the mental condition remained unchanged. One died from cachexia in the course of the treatment and the treatment of one failed. The two patients who had had malarial therapy improved. Twelve patients improved from the treatment, two died from dementia paralytica and the treatment of one failed. No complications occurred. The author concludes that the arsenical-bismuth therapy in dementia paralytica is effective and that blindness will not occur if proper indications and small doses evenly divided are adhered to.

Sovetskiy Vrachebnyy Zhurnal, Leningrad

June, 1940 (No. 6) Pp. 401-480. **Partial Index**

Problems of Scientific Investigation of Bacillary Dysentery. O. O. Gartokd.—p. 401.
*Basic Principles in Bacteriophage Therapy in Bacillary Dysentery. S. V. Viskovskiy.—p. 411.
Chemotherapy of Epidemic Cerebrospinal Meningitis. P. S. Chulkov, K. Ya. Krauklis and G. N. Christovich.—p. 417.
Sulfidine Therapy in Pneumonia and Meningococcic Meningitis of Young Children. A. F. Karaev and B. S. Dunaevskaya-Tarnogradskaya.—p. 427.
Zinc-Iontophoresis Therapy of Infected Wounds. N. N. Mishuk.—p. 435.

Bacteriophage Therapy in Bacillary Dysentery. — The disappointing results with vaccine treatment of bacillary dysentery, according to Viskovskiy, are to be explained by the variability of bacilli of dysentery, as a result of which the polyvalent vaccine could not be definitely specific. The discovery of bacteriophage by d'Herelle made possible the preparation of a substance with a specific destructive effect on the causative agent of bacillary dysentery. Viskovskiy reports on 3,549 patients with various forms of dysentery treated with bacteriophage in the course of the last three years. A control group of 5,398 patients were treated according to the orthodox regimen. The effect of the bacteriophage therapy is that of sterilization. It possesses no antitoxic property. For this reason the author adheres to the combined bacteriophage and serum therapy. The bacteriophage was given by mouth. Because the bacteriophage is completely inactivated by even traces of hydrochloric acid, the stomach contents must be evacuated prior to administration of the bacteriophage or the acidity neutralized by administration of from 10 to 15 cc. of a 5 per cent solution of soda. Bacteriophage therapy is effective only in the early days of the disease. It is without any effect after the fifth day because the predominant role at this stage is no longer assumed by the microbe but by the profound alterations which have taken place in the bowel, in the vegetative nervous system and in the metabolism. The bacteriophage is given in a repeated dose forty-eight hours after the first, or after twenty-four hours when the first dose has not given the expected clinical results. Comparison of the two groups showed that in the group treated by the bacteriophage there was no increase in the summer mortality, while in the control groups it rose from 2.8 per cent to 4.24 per cent. Mortality in the group due to the Shiga bacillus was lowered three and a half times as compared with the control group; in the group caused by Flexner bacillus twice, while in a group of 160 cases caused by the Kruse-Sonne organism there was only one death. The author concludes that, while the mode of action of the dysentery bacteriophage in a human organism has not been elucidated, the effect of its therapy is superior to any one measure so far advanced.

Acta Medica Scandinavica, Stockholm

104:427-525 (June 27) 1940

Frequency of Prolapsus Disci Intervertebralis as Cause of Sciatica. T. Andersen.—p. 427.
Adrenalotropic, Hypophysial Hormones in Cerebrospinal Fluid During Arterial Hypertension in Man and Dog. A. van Bogaert and F. van Baarle.—p. 462.
Influenza Epidemic of February-March 1939 in the Garrison at Groningen. J. Mulder.—p. 481.
*Treatment of Infectious Mononucleosis with Specific Convalescent Serum. H. C. A. Lassen and S. Thomsen.—p. 498.
Amyloidosis Induced by Tumors of the Kidney. E. Ask-Upmark.—p. 512.

Specific Convalescent Serum in Infectious Mononucleosis. — Lassen and Thomsen report the successful use of specific convalescent serum in twelve cases of infectious mononucleosis, nearly all presenting severe angina with considerable lymph node enlargement, selected from a larger number serving as control groups. The serum was obtained from the blood of adult patients one or two weeks after they had become free from fever and was injected intravenously in total doses varying from 60 to 300 cc. The control groups were treated respectively with nonspecific serum (diphtheria antitoxin in forty-five of fifty cases), with neoarsphenamine or symptomatically with analgesics and antipyretics. One fourth (25 per cent) of the twelve cases showed a critical fall of temperature within twenty-four hours, an additional 50 per cent (six) within the first forty-eight hours. All twelve patients felt subjectively improved within twenty-four hours after the injections; eleven (92 per cent) exhibited a distinct objective improvement within the same period. No subsequent complications were noted, such as peritonsillar abscess or otitis. Comparably, in the largest control group preponderantly treated with diphtheria antitoxin only 34 per cent (seventeen) showed a fall of temperature within forty-eight hours and none within twenty-four hours, although the patients of this group had been given treatment twenty-four hours after hospitalization. Results such as those obtained in the twelve cases were observed in only a small number of the patients treated otherwise than by specific convalescent serum. Neoarsphenamine appeared to be ineffective although this group (twenty-seven) included cases of considerably milder attacks of the disease. The authors believe that infectious mononucleosis has not quite so favorable a prognosis as was formerly assumed and that a considerable number of cases may be masked as septic angina, malignant diphtheria and disorders of the central nervous system.